PRINTRONIX®

User's Manual

The Printronix L5535 Multifunction Printer

Consumables Information

Printronix® has years of experience designing printer imaging systems. For the best possible performance of your Printronix printer, use Genuine Printronix parts and supplies.

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Consumable Item	Part Number	Replacement Interval (in Pages)[1]
Toner cartridge	703532-001	21,000
Waste toner bottle	202984-001	150,000
Photoreceptor drum	703535-001	150 - 300,000 See Note 2
Developer	703548-001	150,000
Developing Unit	705739-001	600,000

Note 1: Varies with paper size, media type, and toner coverage.
Note 2: Inspect every 150,000 pages; clean if needed. Replace at 300,000 pages or sooner of print quality is no longer acceptable. Drum life is dependent upon media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) may reduce drum life as much as 50%.

For more information, please go to our website at **www.printronix.com**.

L5535 Multifunction Printer

User’s Manual

171516-001C

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Table of Contents

1 *Introduction*

About This Manual

This manual explains how to use your printer.

Safety Notices And Special Information

For your safety and to protect valuable equipment, it is very important that you read and comply with all information highlighted under the following special headings:

WARNING **A warning notice calls attention to a condition that could harm you.**

WARNUNG

Ein Warhinweis dieser Art weist auf Verletzungsgefahr hin.

AVISO

Las notas de adviso llaman la atención sobre una condición que puede causar lesiones.

ATTENTION

Attire votre attention sur une opération pouvant présenter un danger.

AVVERTENZA

Un'indicazione di avvertenza segnala una condizione di pericolo suscttibile causare lesioni all'operatore.

CAUTION **A caution notice calls attention to a condition that could damage the printer.**

IMPORTANT **An important notice provides information that is vital to proper operation of the printer.**

NOTE: A note provides information and helpful tips about printer operation.

Control Panel Keys And Display Messages

Keys and indicators that are labeled on the printer are printed in uppercase letters. For example:

Press ENTER to select the value shown on the LCD.

Messages that appear on the control panel message display (called the Liquid Crystal Display, or LCD), are printed in uppercase letters and enclosed in quotation marks. For example:

“ENTER SWITCH LOCKED" appears on the LCD.

General Safety Precautions

This chapter provides safety information that will help you prepare for installation and operation of the printer. The actual installation, initial setup, and testing should be performed only by a factory-trained service representative.

Observe the following precautions at all times to ensure safe operation of the printer.

Read all instructions before you do any procedures.

Follow all safety notices and instructions printed in this manual and marked on the printer.

The operator-accessible power switch does not shut off all power to the printer. You must unplug the power cord to shut off all power to the printer.

The power outlet must be installed near the equipment and must be easily accessible.

The printer relies on protective devices in the building installation for protection. The printer must be connected to a 30 Amp, 250 V outlet.

Do not operate the printer in a room that is not properly ventilated. The room should be at least 1,000 cubic feet with complete air exchange every two hours.

Keep combustible materials away from the printer. Dispose of used toner properly, as it is flammable.

Some components in the printer are potentially hazardous. For example, the fuser unit becomes very hot under normal operating conditions, and several components use high voltage.

Handle the photoreceptor drum properly, due to the nature of the material. Do not put used drums in the trash; ship them to the appropriate disposal facility for recycling. (See page 146.)

Do not block or obstruct any cabinet ventilation slots.

Never spill liquid of any kind on or in the printer. Use only manufacturer-approved cleaning agents and methods.

Make sure nothing rests on the power cord. Do not locate the power cord where people will walk on it. Do not place the power cord under any carpet.

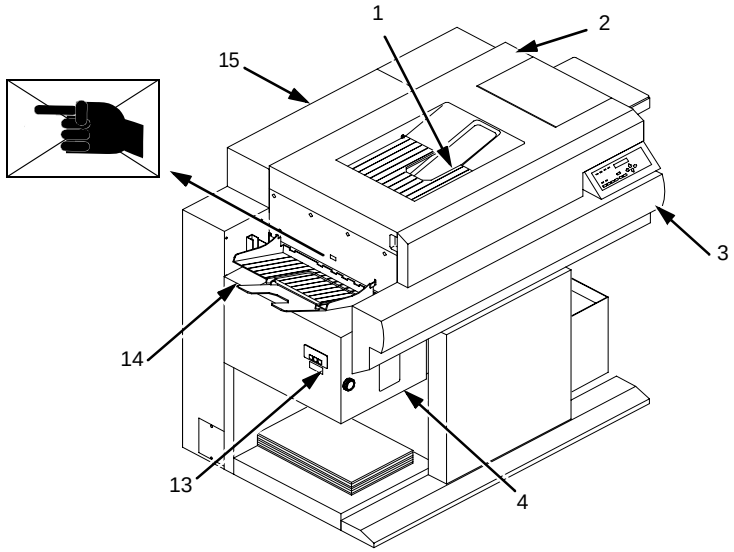
Do not lean on or place heavy objects on top of the printer.

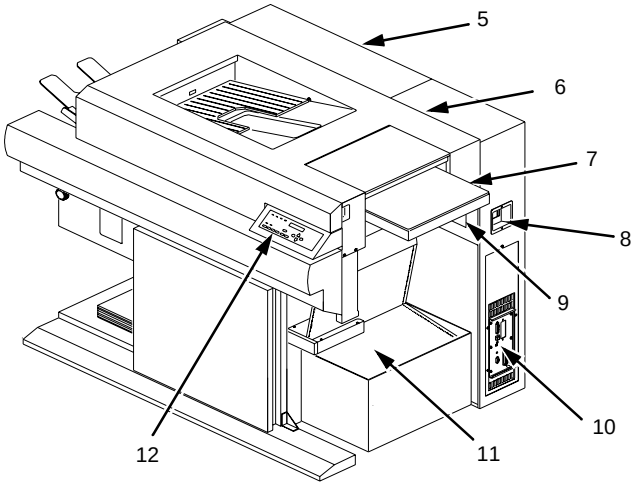
Do not put your hand into the power paper stacker when the printer is in operation.

Turn off the power immediately if the printer emits an unusual noise or smell.

Do not look directly at the flash lamp light.

Safety Label Locations And Printer Views

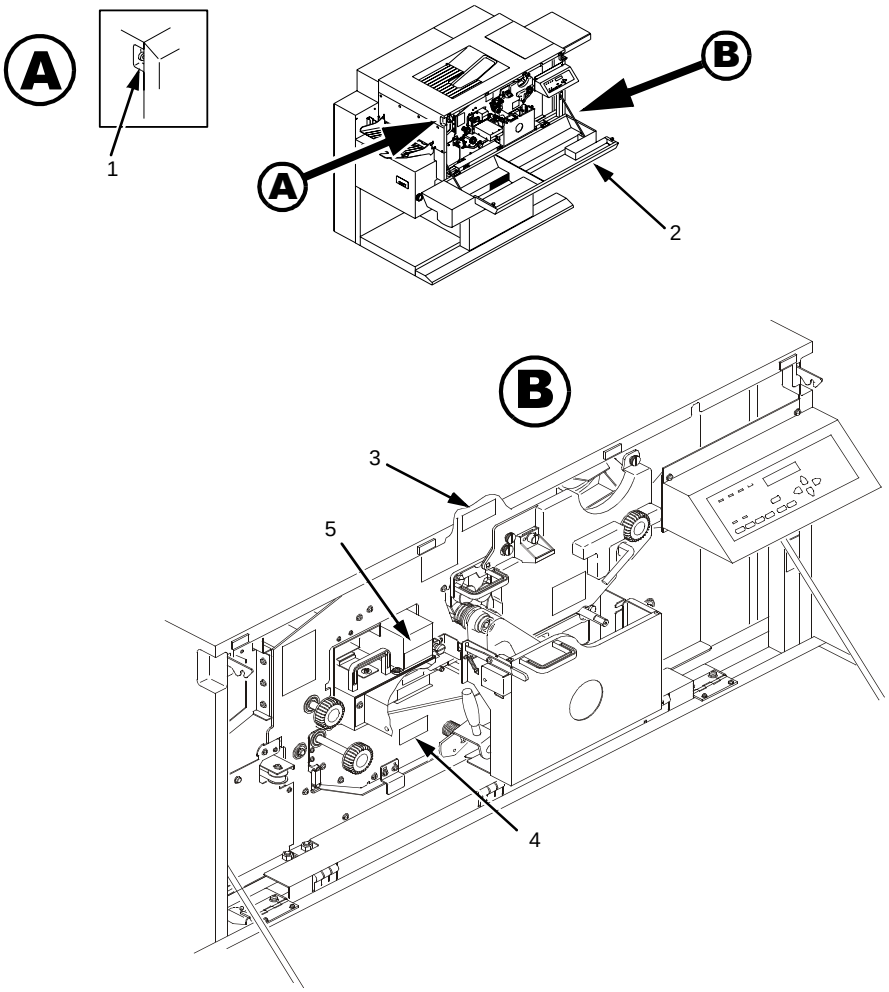




Legend:

1) Face Down Paper Output Tray
2) Top Cover
3) Front Upper Cover
4) Power Paper Stacker(Optional)
5) Rear Cover
6) Top Cover
7) Cut Sheet Paper Input Cassette (Optional)
8) Power Switch
9) CAUTION
10) Host I/O Connections
11) Fanfold Paper
12) Control Panel
13) CAUTION
14) Face Up Paper Output Tray
15) Rear Cover

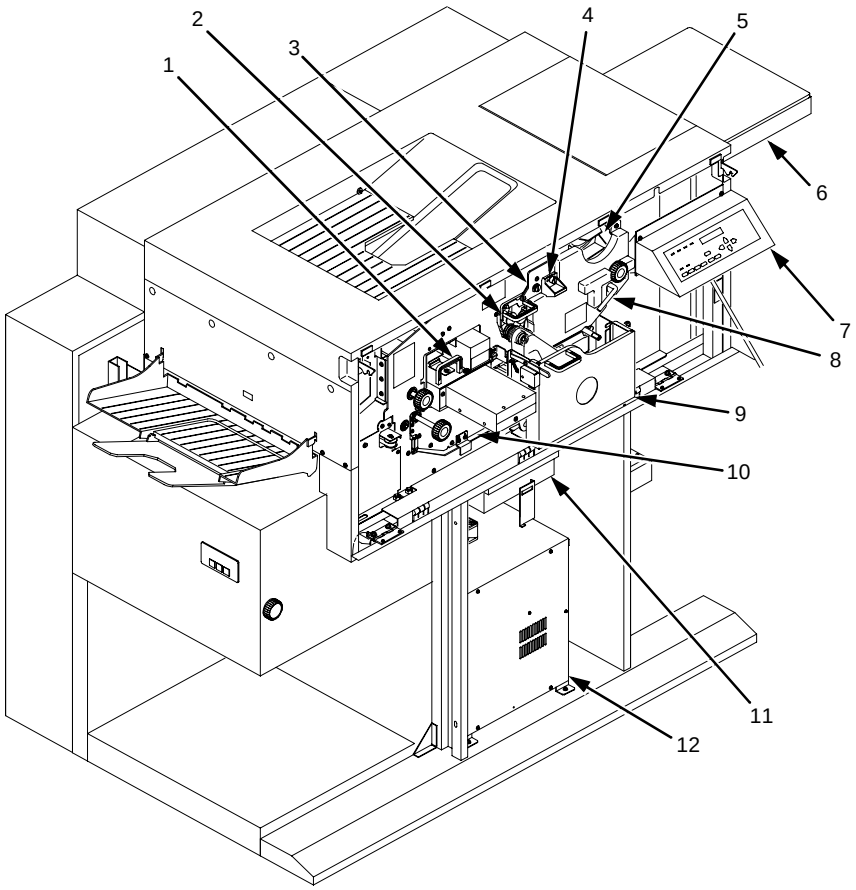
Figure 1: Front and Side Views



Legend:

1) Open/Close Button
2) Front Upper Cover
3) CAUTION
4) CAUTION
5) WARNING

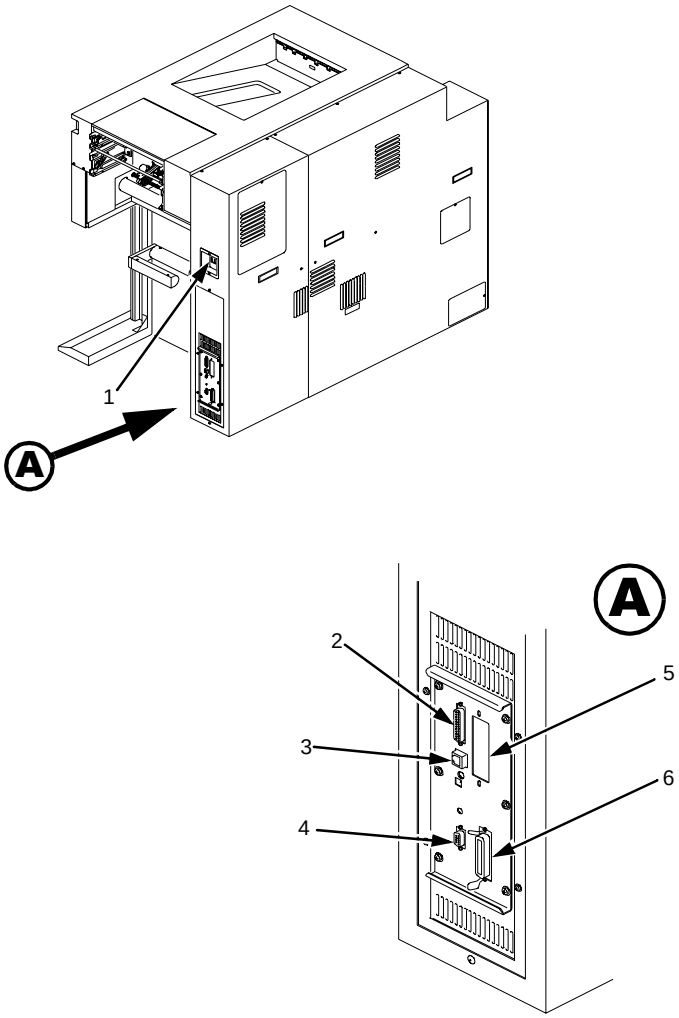
Figure 2: Front View with Front Upper Cover Open



Legend:

1) Fuser Unit
2) Cleaning Unit
3) Discharge LED (not visible)
4) Main Charger
5) Toner Cartridge
6) Optional Cut Sheet Paper Input Cassette
7) Control Panel
8) Developing Unit
9) Waste Toner Recovery Unit
10) Transport Unit
11) Smoke Filter Box
12) Flash Lamp Power Supply

Figure 3: Front View with Front Covers Removed



Legend:

1) Power Switch
2) Serial Port
3) Diagnostic Port
4) General Purpose I/O Port
5) Optional Coax/Twinax Port
6) Parallel Port/Optional Ethernet Port

Figure 4: Rear Cover

About The Printer

Features

Printing speed is 35 pages per minute on continuous letter size and A4 size fanfold forms (long edge fed). In the optional cut sheet mode, printing speed is 27 pages per minute on letter size and A4 size cut sheet forms (long edge fed). The printer produces printed output with a 300 x 300, (or optionally) 240 x 240 or 400 x 400 dots-per-inch (dpi) resolution in either the continuous form or cut sheet printing mode. See Appendix B for printer specifications.

Features include the following:

- Continuous fanfold paper and optional cut sheet forms handling
- User-replaceable toner cartridge
- DuraFusion® flash fusion technology
- Liquid crystal display that provides operating and error messages
- Flash memory which stores emulations
- Non Volatile memory which stores preset configurations
- Serial and parallel interfaces
- Ethernet™ network adaptor (optional)
- Coax/Twinax interfaces (optional)
- Power stacker (optional)

Emulations

Your printer comes equipped with the Printronix® LinePrinter Plus® emulation software (which emulates an impact printer). Printronix LinePrinter Plus includes the following printer protocols:

- P-Series
- P-Series XQ
- Serial Matrix

- Proprinter® III XL
- Epson® FX-1050

Printronix LinePrinter Plus provides portrait and landscape image orientation. Automatic 1-up, 2-up, 4-up, and gray bar overprinting are also provided. The emulation also offers optional proportional (scalable) fonts.

The following optional emulations are also available:

- IGP®/PGL®
- IGP/VGL
- PCL5®
- IPDS™

For specific information on each emulation, see the appropriate emulation manual.

Fonts And Forms

The printer provides a variety of resident fonts. The emulation you are using determines what resident fonts are available. For example, the LinePrinter Plus emulation provides CG Times, Letter Gothic, Courier, OCR-A, and OCR-B as standard sets of fonts.

With either the LinePrinter Plus or PCL 5 emulations, you can load additional fonts into printer memory from the host computer. The additional fonts can be loaded into the printer memory using the download procedure or using host commands. The additional fonts can be loaded into RAM or Flash memory. If the additional fonts are loaded into RAM, they will be lost when the printer is reset or powered off. Additional fonts are accessed by host commands.

You can store forms together with fonts. The storage space for forms and fonts depends upon the amount of printer memory and/or non-volatile Flash memory space available. You can manipulate different fonts and/or forms depending upon the emulation installed.

2 *Initial Setup*

Installation Overview

The installation and setup of your printer is intended to be done by a service provider who has been trained and authorized by Printronix. Your service provider is also responsible for doing a preinstallation site survey, unpacking the printer, connecting the power and host data cables, and installing the first set of consumable items in the printer. Depending on the terms of your service contract, your service provider might also power on your printer and configure it. As the owner of the printer, it is your responsibility to provide adequate ventilation and power for the printer.

Loading Paper

This section explains how to load fanfold paper. To load cut sheet paper, go to page 33.

Loading Fanfold Paper

When loading fanfold paper, be sure the leading edge of the paper has a clean, separated perforation (without ragged edges or paper chaff).

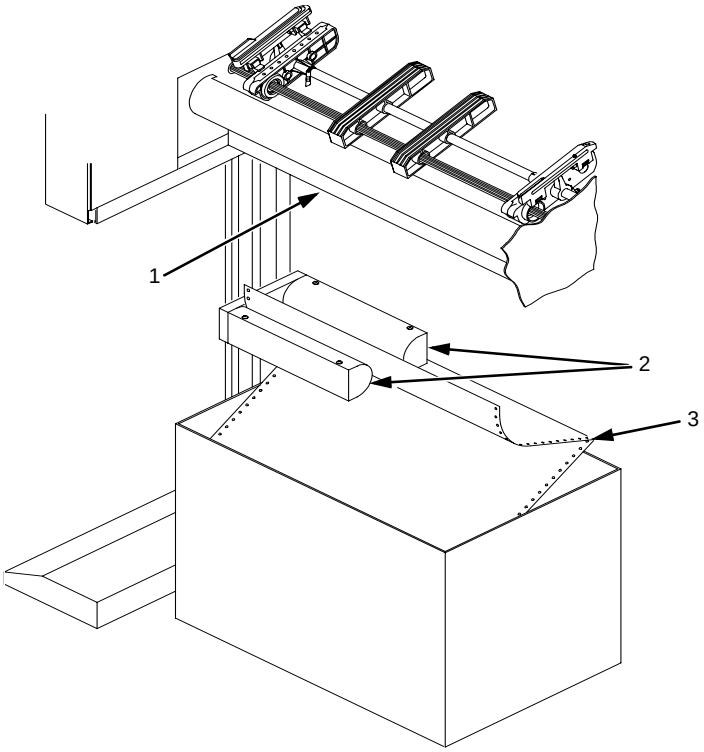
NOTE: If the printer runs out of paper during printing, you do not need to turn off printer power to replace paper. If you leave the power on when you replace the paper then place the printer online, it will resume printing automatically where it left off.

Repeat the following steps whenever top-of-form must be reset (after clearing a paper jam, loading new paper, etc.).

1. If your printer has the optional power paper stacker, set the stacker page length adjustment on the side of the power stacker to match the paper length you are using.
2. Place the fanfold paper box under the tractor unit with the first paper fold toward the printer.

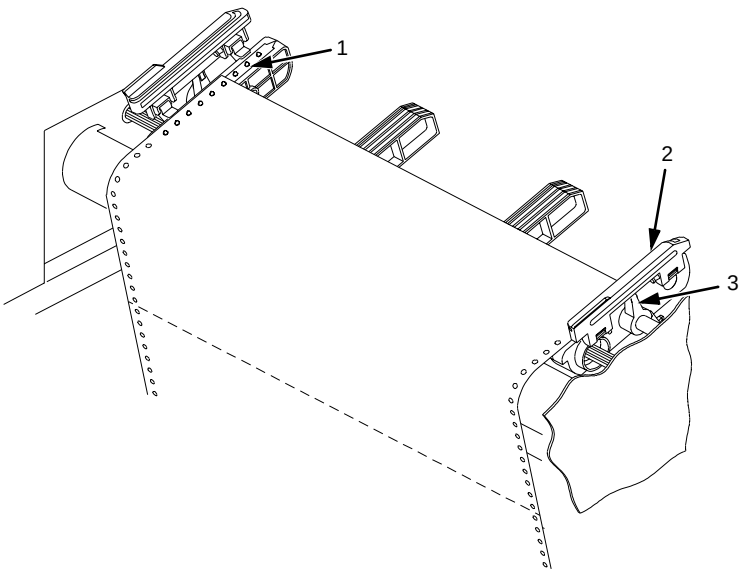
IMPORTANT **The first fold of the paper must face the printer. Otherwise, a paper jam could occur during printing.**

3. Pass the leading edge of the paper between the lower paper guides, as shown in the illustration below.



Legend:

1) Tractor Unit
2) Lower Paper Guide
3) First paper fold is toward printer



Legend:

1) Tractor Pins
2) Tractor Gate
3) Tractor Lock

4. Unlock only the right tractor by pushing forward on the tractor lock.
5. Open the left and right tractor gates and place the paper about half-way onto the tractor pins.

IMPORTANT **Do not push the paper past the tractors into the area of the paper jam sensor.**

6. Close the left tractor gate.
7. Move the right tractor to the left or right until its pins line up with the holes in the right edge of the paper, put the paper in the pins, then close the right tractor gate.

NOTE: After you place the paper on the tractors, introduce a slight amount of side-to-side tension into the paper. Set the right tractor far enough to the right so that there are no wrinkles, looseness, etc. in the paper. Do not set the right tractor too far to the right, however, as too much tension may cause the paper holes to tear away from the tractor pins.

8. Tension the paper by moving the right tractor slightly outward and lock the right tractor with the tractor lock.
9. If you are reloading paper following a “FAN-FOLD PAPER EMPTY” message with the printer power on, press ONLINE to place the printer online. The printer automatically sets the physical top of form at the leading edge of the paper and resumes printing.

Loading Cut Sheet Paper

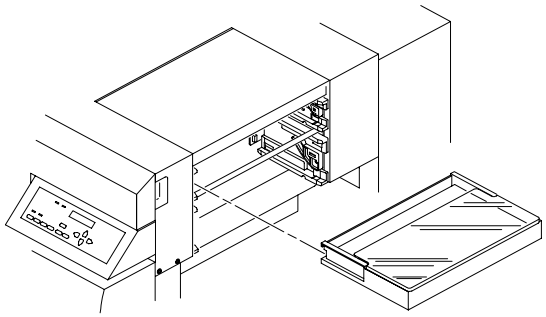
Upper and lower paper input cassettes are also provided if your printer is equipped with the cut sheet paper feed option. When printing on cut sheet paper, you can select either of two paper output trays: the face down tray (default) or the face up tray.

To change the paper output tray selection, see the Cut Sheet Output option on the Paper Control menu, page 100.

NOTE: If the printer runs out of paper during printing, you need not turn off the printer to replace paper. If you leave the power on when you replace the paper and place the printer online, it will resume printing automatically where it left off.

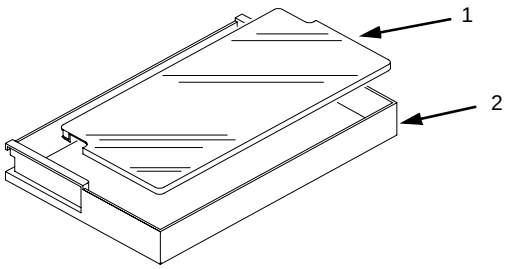
To load cut sheet paper, do the following steps:

1. Pull out the paper cassette and remove its cover.



2. Load the new paper uniformly in the cassette, making sure the leading edge of the paper is at the front of the cassette. Do not load more paper than specified below, otherwise a paper jam may occur.

17-20 lb. bond	Upper cassette	250 sheets or less
	Lower cassette	500 sheets or less
21-44 lb. bond	Upper cassette	1 inch or less in thickness
	Lower cassette	2 inches or less in thickness



Legend:

1) Cassette Cover
2) Cassette

3. Cover the cassette and insert it into the printer, making sure it is completely seated. If the cassette is not seated, a paper jam may result.
4. If you are reloading paper following a “CUT-SHEET PAPER EMPTY” message with the printer power on, press ONLINE to place the printer online. The printer resumes printing.

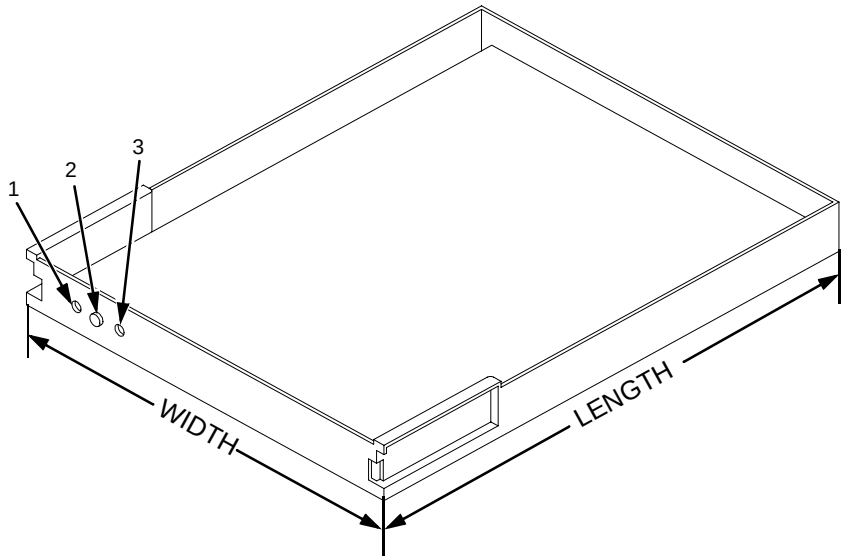
NOTE: Occasionally, paper may become moist and wavy, resulting in poor print quality. If this occurs, remove the wavy sheets of paper from the cassette and replace them with those from a new package.

In order to minimize the possibility of a paper jam:

- Only use xerographic quality paper.
- Load paper in a cassette which has been adjusted for the exact paper size. (To set the cassette for the paper size, see the following section.)
- Do not gather loose paper for use.
- Do not use wrinkled, folded, or moist paper.
- Do not leave paper in the cassettes overnight.
- Always store unused paper in a clean, dry area protected from sunlight.
- If a paper package is opened but not fully used, rewrap and seal the package and store it properly for future use.

Changing Cassette Paper Size

The cut sheet paper option comes with four cassettes (paper trays) preconfigured for either U.S. or Metric paper sizes. An optional custom (special) tray for variable cut sheet lengths is also available. If the configurations of these cassettes do not meet your needs, you can reconfigure the cassettes as described below, or you can buy additional cassettes.



IPS 10, 11, and 12 = Upper level paper size detector sensors
IPS 20, 21, and 22 = Lower level paper size detector sensors

Legend:

1) IPS (Paper Size Insert) 12/22
2) IPS 11/21
3) IPS 10/20

There are three holes in the forward end of the cut sheet paper feed cassettes. Plastic inserts are set in these holes according to the size of the cut sheet paper loaded in the cassette (as shown in the table that follows).

When the plastic inserts in the cassette contact the paper size sensors on the printer, the printer determines that the paper cassette is in position and identifies the paper size.

The following table lists the available standard settings for the cut sheet paper feed cassette (0 = plastic insert; — = no insert):

Paper Size	IPS 12/22	IPS 11/21	IPS 10/20
Legal	—	0	0
Ledger	0	0	—
A3	0	—	0
B4	0	—	—
Letter	—	0	—
A4	—	—	0
Custom Size (variable length 7.0 to 12.0 inches, variable width 8.3 to 19.6 inches)	0	0	0

Cut Sheet Tray Linking

If your printer is equipped with the cut sheet paper feed option, you can use Tray Linking. Tray Linking is disabled by default. With Tray Linking enabled, when the active cut sheet paper tray runs out of paper, the printer automatically switches to the other paper tray and continues printing.

To enable or disable this feature, see the Tray Linking option on the Paper Control menu, page 96.

NOTE: Disable Tray Linking if the two cut sheet paper trays are of different sizes

If the cut sheet trays are of different sizes, and Tray Linking is enabled, the printer will not switch to the alternate tray when the first tray runs out of paper, nor will it display the usual “CUT-SHEET PAPER EMPTY” message on the LCD. Instead, the printer stops printing and displays the message “TRAY MISMATCH.”

To clear this message, either add paper to the active tray, or insert a matching tray in the alternate tray position. Press CLEAR on the control panel.

Tray linking is disabled by the printer automatically when the lower tray is configured as a variable length tray, and is selected as a source tray. Tray linking is resumed after the lower tray is reconfigured to a standard cut sheet paper size.

Variable Tray Sizes

Variable Tray Width

If your printer is equipped with the cut sheet paper feed option, you can override the standard cut sheet paper tray widths with a feature called Custom Tray Width. The standard cut sheet paper tray sizes are listed in the table on page 37. Using Custom Tray Width and specially-modified paper trays, it is possible to use nonstandard paper stock that is wider or narrower than the standard paper widths.

If you are using the Custom Tray Width feature, use the control panel to adjust the width of the image in the printer to match your nonstandard width paper.

To set a custom tray width, see Variable Tray Width on the Paper Control menu, on page 96.

NOTE: The Custom Tray Width feature requires specially modified paper trays.

Variable Width is enabled, but the values are resumed after the lower tray has been reconfigured to standard paper size.

Paper selection has to be set to the lower tray with a custom tray inserted in order to make the variable tray width available through the control panel.

Variable Tray Length

If your printer is equipped with the cut sheet paper feed option, it is possible to override the standard cut sheet paper tray lengths. This feature is called Custom Tray Length. The standard cut sheet paper tray sizes are listed in the table on page 37. Using Custom Tray Length and specially modified paper trays, it is possible to use nonstandard paper stock that is longer or shorter than the standard paper length. You can use nonstandard length paper only in the lower tray.

If you are using the Custom Tray Length feature, use the control panel to adjust the length of the image in the printer to match your nonstandard length paper from the front panel.

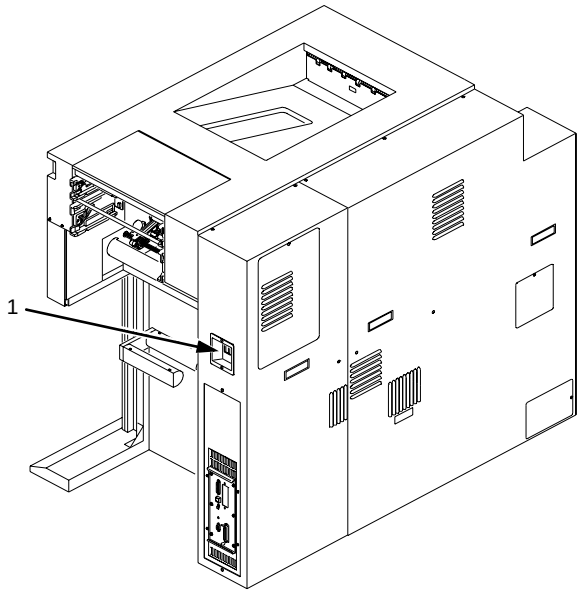
To set a custom tray length, see Variable Tray Length on the Paper Control menu, detailed on page 96.

NOTE: The Custom Tray Length feature requires specially modified paper trays.

Variable Length feature is enabled when the Variable Tray Length is enabled, but the values are resumed after the lower tray has been reconfigured to standard paper size.

Paper selection has to be set to the lower tray with a custom tray inserted in order to make the variable tray length available through the control panel.

Powering On The Printer



Legend:

1) Power Switch

CAUTION **The printer must be connected to a 220-240 VAC, 30 Amp, 50-60 Hz power source, as shown on the rear panel label. Using an incorrect power source may damage the printer.**

1. Turn on the printer by setting the power switch to | (on).
2. Note that when you power on the printer, the following occurs:
   a. The printer reads the emulation boot file and displays the message:
   “TESTING HARDWARE
   PLEASE WAIT...”
   b. If there are no bootup errors, the LCD displays:
   “DIAGNOSTICS PASSED”
   c. STAND BY Light Flashes
   d. The ONLINE indicator lights continuously and STAND BY goes out.

NOTE: The printer can be set to power on in the OFFLINE state instead of the ONLINE state. To print, ONLINE must be lit; if it is not, press ONLINE.

If other messages and prompts appear on the control panel, answer the prompts and follow the directions as explained in Table 6, “Error Messages,” page 228.

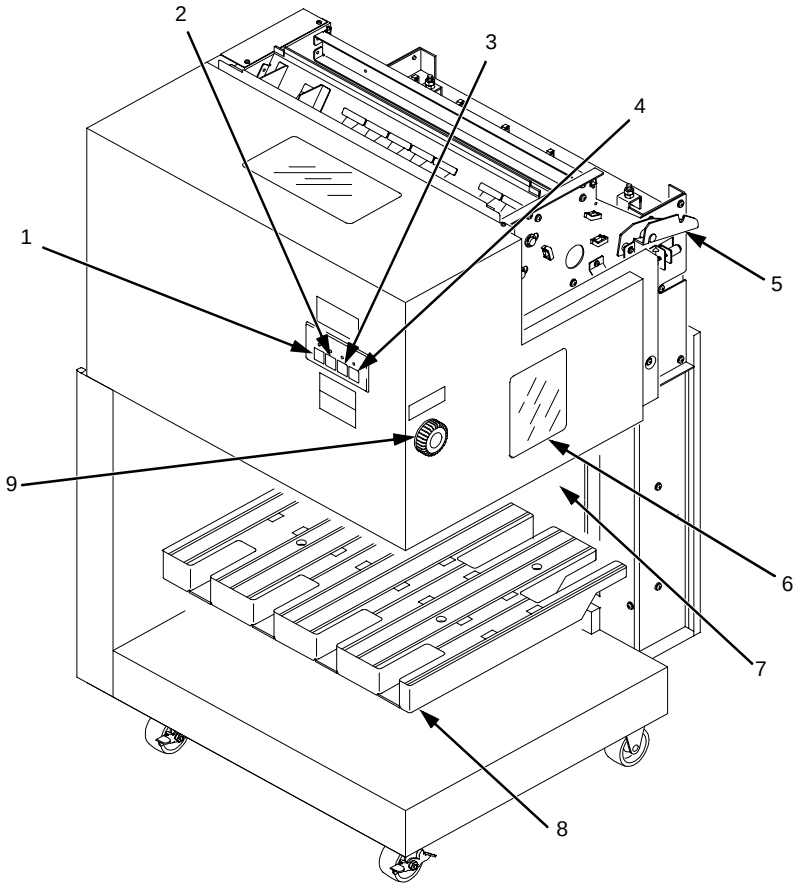
Power Paper Stacker

Safety Feature

To prevent injuries, the optional power stacker is equipped with two safety stop bars located under the edge of the stacker. When the safety bars are pressed, stacker operation stops immediately. When the AUTO key is pressed, the stacker resumes operation.

Parts Of The Power Stacker

The front (output side) of the power stacker is shown in the following figure.



Legend:

1) AUTO Key
2) STOP Key
3) DOWN Key
4) HEAVY Key
5) Hook
6) Head/Tail Length Measuring Gauge (in inches)
7) Safety Stop Bar (not visible in figure)
8) Elevator
9) Top/Bottom Adjust Knob

Stacker Operation Keys

The power paper stacker contains the four keys for operating the elevator:

- **AUTO**: Sets the elevator in automatic mode. Pressing this key causes the elevator table to rise until it reaches its maximum upper position and enables the stacker.
- **STOP**: Stops the elevator, and displays the message "STACKER NOT READY" on the printer control panel. The STOP key may be used to stop the elevator from lowering after pressing the DOWN key.
- **DOWN**: Lowers the elevator to its lowest position, or until the STOP key is pressed.
- **HEAVY**: ON equals "Heavy Mode" for thicker paper (LED is lit); OFF equals "Normal Mode" for thinner paper (LED is not lit). This key is only active in STOP mode and when there is no paper in the stacker.

When operating the power stacker in Heavy Mode, the maximum stack height following a cut or page eject depends on the page length, as shown in the following table:

Page Length (Inches)	Max. Stack Height (Inches)
7.0	7.5
7.5	7.2
8.0	7.0
8.5	6.6
9.0	6.4
9.5	6.1
10.0	5.8
10.5	5.5
11.0	5.3

Page Length (Inches)	Max. Stack Height (Inches)
11.5	5.0
12.0	4.8

NOTE: Normal Mode supports up to 28 lb. bond (105 g/m^2). Heavy Mode must be used for media weights greater than 34 lb. bond (128 g/m^2). Some media that are 28 lb. bond (105 g/m^2) and higher require Heavy Mode for reliable stacking.

Setting The Stacker Page Length

Set the stacker page length to match the actual page length. On the side of the stacker, locate the adjustment knob and the window containing a measuring gauge (a pointer with a scale). Rotate the knob until the pointer matches the page length being used. (See page 42.)

Setting The Printer Page Length

NOTE: If the printer page length does not match the stacker page length, the timing of the stacker swinger arm will be incorrect, resulting in a folding error.

Set the printer page length by following the instructions for changing printer configuration. (See the Paper Control menu on page 96.)

Removing Paper

1. After a print job, press the PAGE EJECT key on the printer control panel.
2. Tear the paper at the perforation.
3. Press the DOWN key on the stacker to lower the elevator.
4. Press the STOP key on the stacker when the elevator is about half-way down.

NOTE: The elevator stops automatically when it is fully loaded, without the STOP key being pressed.

5. Remove the completed print job from the elevator, and do one of the following:

- To change the paper mode, go to Step 6.
- To reload paper after a paper path error, go to Step 7.
- To resume operation, go to Step 8.

6. If necessary, you may change the paper mode at this point, by pressing the HEAVY key. ON equals “Heavy Mode” for thicker paper (LED is lit); OFF equals “Normal Mode” for thinner paper (LED is not lit). This key is only active in STOP mode and when there is no paper in the stacker.
7. If the printer reports an error which requires the paper path to be cleared, be sure to reload the paper with the first perforation facing inward (see page 30). Then press the CLEAR key on the control panel. Otherwise, the paper may jam or fold incorrectly.

CAUTION **Always remove all paper from the elevator before pressing the AUTO key on the stacker. Failure to remove all paper may damage the stacker.**

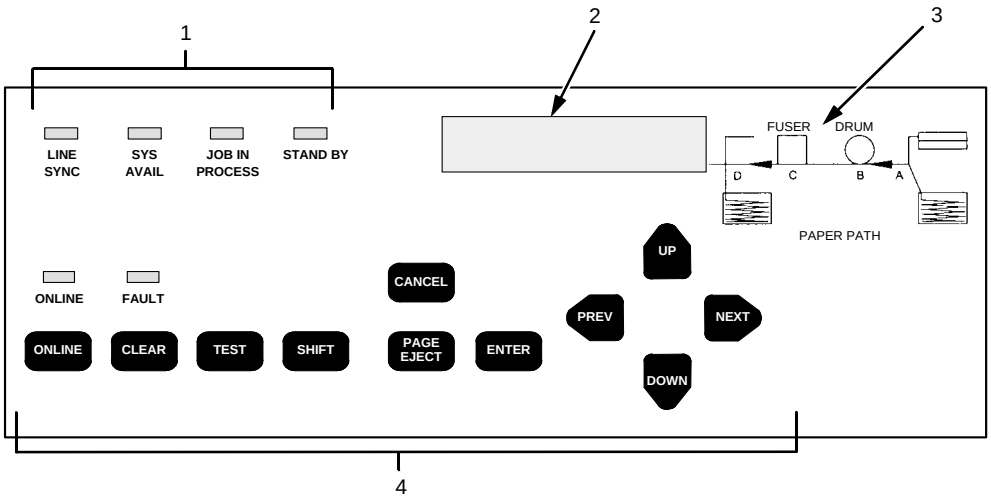
8. Press the AUTO key on the stacker to automatically resume operation.

Stacker Full

1. When the stacker becomes full, the printer automatically separates the paper at the perforation, returning the edge of the paper to home position on the tractors.
2. Press the DOWN key on the stacker.
3. Remove all paper from the stacker elevator.
4. Press the AUTO key on the stacker to resume operation.
5. Press the CLEAR key on the printer control panel, to clear the fault message and place the printer online.

6. Check paper input to the printer to insure the first paper perforation is facing the printer and reload paper, if necessary, to align the first paper perforation.
7. If the Reprint on Fault option is enabled in the Paper Control menu, the printer reprints the applicable pages. (See the Paper Control menu on page 96. Also see “Reprinting Pages after Fault Condition on page 223.)
8. Press the ONLINE key on the printer control panel, to place the printer online.

Using The Control Panel



Legend:

1) Status Indicators
2) Liquid Crystal Display (LCD)
3) Paper Path Diagram
4) Function Keys

The control panel is located on the top right side of the front cover.

Liquid Crystal Display (LCD)

The liquid crystal display (LCD) displays messages, printer operating status, configuration options, and error codes.

Status Indicators

The status indicators display the current operational status of the printer.

LINE SYNC

Twinax interface only. Indicates there is activity on the line from the host computer.

SYS AVAIL

Twinax interface only. Indicates there is activity to the current address on the line.

JOB IN PROCESS

When the printer is receiving data or processing data, JOB IN PROCESS flashes. If data has been processed and is waiting to be printed, or has been printed but not yet fused and ejected by the printer, JOB IN PROCESS lights continuously.

JOB IN PROCESS does not light when the printer is not processing data, no data exists in the buffer, and the printer is not receiving data.

STAND BY

STAND BY flashes while the printer is executing any control panel command, and while the printer is unavailable for printing due to its normal system activities, such as booting, printing its configuration, writing status information, and loading applications.

IMPORTANT **Do not press any control panel key when STAND BY is flashing. The printer may carry out unwanted commands.**

ONLINE

ONLINE is lit continuously when the printer is online (when the printer is ready to print and accept data from the host). It flashes when the printer is offline or when the printer stops because of an error.

FAULT

FAULT flashes when the printer is unavailable for printing because of an internal error.

Function Keys

The pressure-sensitive function keys are located directly below the status indicators. When pressing the keys, a “beep” verifies contact.

The function keys permit you to configure the options of the printer. You can access these options via a structured menu which is displayed on the LCD. To navigate through the options, use the UP, DOWN, NEXT, and PREV keys. Press ENTER to select an option that appears on the LCD.

The purpose of each function key (under normal printing mode) is defined below.

For specific procedures and information regarding the configuration menu, see page 41.

NOTE: You can enable or disable the panel key sound via the configuration menu.

ONLINE Key

The ONLINE key toggles the printer online and offline.

- To place the printer online, press ONLINE until the ONLINE status indicator remains continuously lit. The LCD displays “ONLINE,” along with the name of the current emulation. The printer can now receive and process data and print.

- To place the printer offline, press ONLINE until the ONLINE status indicator blinks. The LCD displays “OFFLINE.” The printer stops processing and printing any new data, except for any pages in process.
- To start downloading printer operating system files to the printer, hold down the ONLINE + CLEAR keys while cycling printer power. See Chapter 3 for more information.

NOTE: When the printer is not in an error state, pressing ONLINE in any level of the configuration menu causes the printer to accept any configuration changes you have entered and return to online status.
When the printer is in an error state, pressing ONLINE in any level of the configuration menu causes the printer to re-display the fault message.

CLEAR Key

- In the fault state, press the CLEAR key to clear errors and reset the printer to the offline state (if all errors are cleared).
- To start downloading printer operating system files to the printer, hold down the ONLINE + CLEAR keys while cycling printer power. See Chapter 3 for more information.

TEST Key

When the printer is offline, you can run a test print, as configured under the Test Print menu (page 96), by pressing the TEST key. To stop the test print, press TEST again.

Pressing TEST when the printer is online has no effect.

SHIFT Key

This key does not have a function of its own. It is combined with other keys to modify their functions.

PAGE EJECT Key

The PAGE EJECT key performs the following functions when the printer is online:

When the JOB IN PROCESS status indicator lights steadily, pressing PAGE EJECT causes the printer to print all data in the printer. The page is then cut at the perforation (unless the Burst On Eject option is disabled).

When the JOB IN PROCESS status indicator flashes, pressing PAGE EJECT causes the printer to attempt to print any data in the buffer. The paper motion caused by the page eject operation may interrupt the printing of data that is not currently in the buffer. Once the paper motion has occurred, the data that was not yet in the buffer should print. The page is then cut at the perforation (unless the Burst On Eject option is disabled).

To start downloading files to the printer, power off, then press the PAGE EJECT + ONLINE key and hold them down while powering on the printer. (See “Downloading Files Into Flash Memory” section in Chapter 3.)

IMPORTANT **Do not press PAGE EJECT while JOB IN PROCESS is flashing, or your print job might become misaligned.**

When the JOB IN PROCESS status indicator is not lit or flashing, PAGE EJECT has no effect.

Pressing the SHIFT + PAGE EJECT keys together moves the paper one page length without printing or cutting the paper. It can be used to feed the paper into (customer-supplied) postprocessing equipment.

ENTER Key

When you are entering parameters in the configuration menu, press ENTER to select the value shown in the LCD. The printer confirms your selection by placing an asterisk (*) next to the value in the display. However, if the ENTER key is locked, “ENTER SWITCH LOCKED” appears and the value is not accepted.

CANCEL Key

The CANCEL key performs the following functions when the printer is offline:

- Cancels the current page in process
- Cancels any pages queued to print but not yet printed
- Cancels any input data not yet processed
- Clears the reprint buffers
- Cancels a download if one is in process

UP And DOWN Keys

The UP and DOWN keys are used for the configuration menu:

- To unlock or lock the ENTER key, press UP + DOWN at the same time when the printer is offline
- The ENTER key lock can be configured to be a key combination other than UP + DOWN. Refer to the “Unlocking And Locking The Configuration Menu” section in Chapter 3 for more information
- To enter the configuration menu, press DOWN when the printer is offline
- To move between the different levels in the configuration menu, press either UP or DOWN as needed

NEXT And PREV Keys

The NEXT and PREV keys are used to move between the parameter options on the current level of the configuration menu. Press NEXT or PREV to move forward or backward through parameter options.

Chapter 2 Using The Control Panel

3 *Printer Configuration*

Printer Configuration

In order to print data, the printer must respond correctly to interface signals and commands received from the host computer. Configuration is the process of matching the printer's operating characteristics to those of the host computer. The characteristics that define the printer's response to signals and commands received from the host computer are called configuration parameters and are found in the configuration menus. Configuration menu diagrams are shown later in this chapter.

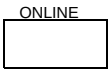
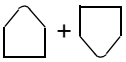
Configuration parameters are retrieved from flash memory, or set from the control panel. This chapter explains how to set and save parameters with the control panel.

IMPORTANT **Configuration directly affects printer operation. Do not change the configuration of your printer until you are thoroughly familiar with the procedures in this chapter.**

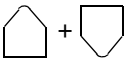
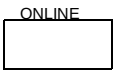
Unlocking And Locking The Configuration Menu

In order to configure the printer with the control panel, you need to unlock the ENTER key, which is locked by default. The locked state secures your configuration, preventing alteration.

Unlocking The Configuration Menu

Step	Press	LCD Message
1. Place the printer offline		OFFLINE CONFIG. CONTROL
2. Unlock the ENTER key (the LCD message appears briefly).		ENTER SWITCH UNLOCKED
3. From this point, either print or modify your current configuration.		

Locking The Configuration Menu

Step	Press	LCD Message
1. At any place within the menu, you can lock the ENTER key.		ENTER SWITCH LOCKED
2. Place the printer online. The second line of the LCD varies, depending on the emulation.		ONLINE LINEPRINTER+

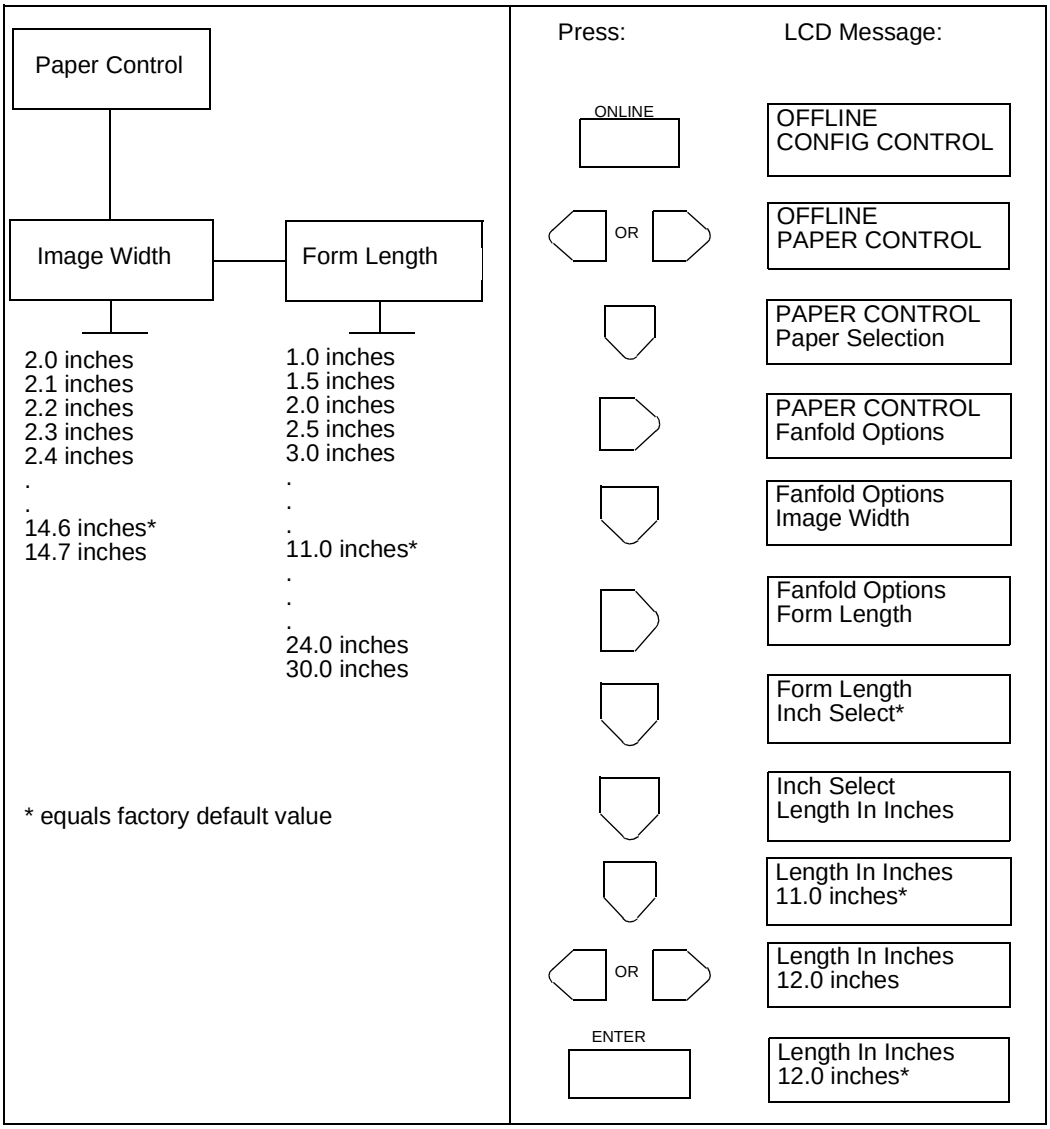
Moving Within The Configuration Menu

Moving Within The Configuration Menu

Movement within the configuration menu is controlled by using the UP, DOWN, PREV, and NEXT keys. The configuration procedure discusses this in more detail. You should not make any configuration changes until you have a printout of your current configuration. (See page 57.)

The following figure shows an example of the steps to follow to change a menu option. The illustration is divided into two parts: the left side shows a portion of a configuration menu, and the right side shows the keys to press to access a particular parameter and the messages that display after you press each key.

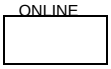
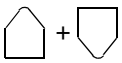
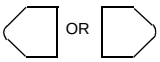
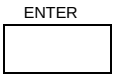
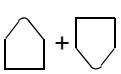
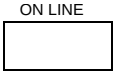
The example shown configures the printer for a form length of 12 inches. Follow these guidelines to move through all of the configuration menus.


Paper Control
Image Width
Form Length
2.0 inches
2.1 inches
2.2 inches
2.3 inches
2.4 inches
.
.
14.6 inches*
14.7 inches
1.0 inches
1.5 inches
2.0 inches
2.5 inches
3.0 inches
.
.
.
11.0 inches*
.
.
.
24.0 inches
30.0 inches
* equals factory default value
Press:
LCD Message:
ONLINE
OFFLINE
CONFIG CONTROL
OR
OFFLINE
PAPER CONTROL
PAPER CONTROL
Paper Selection
PAPER CONTROL
Fanfold Options
Fanfold Options
Image Width
Fanfold Options
Form Length
Form Length
Inch Select*
Inch Select
Length In Inches
Length In Inches
11.0 inches*
OR
Length In Inches
12.0 inches
ENTER
Length In Inches
12.0 inches*

Printing The Current Configuration

You should always printout and store your configurations for future reference. The printout provides a list of the parameters you set when you configured the printer. Each parameter is defined later in the chapter.

To print the current configuration, follow the steps listed below.

Step	Press	LCD Message
1. Place the printer off line.		OFFLINE CONFIG. CONTROL
2. Unlock the ENTER key.		ENTER SWITCH UNLOCKED
3. Select Config. Control.		CONFIG. CONTROL Load Config.
4. Scroll through the Config. Control menu until you reach Print Config.		CONFIG. CONTROL Print Config.
5. Select Print Config.		Print Config. Current
6. Select the current option.		Print Config. Current
7. The STAND BY light flashes, and the printer prints the specified configuration.		
8. Lock the ENTER key.		ENTER SWITCH LOCKED
9. Place the printer online.		ONLINE LINEPRINTER+

Factory Settings

The configuration defaults set at the factory are listed below. These values are available for loading at any time, and are maintained in the printer until a new configuration is loaded.

Table 1. Factory and Configuration Parameters

Menu Item	Default Value
Config. Control	
Load Configuration	0
Save Configuration	1
Print Configuration	Current
Delete Configuration	1
Power-up Configuration	0
Protect Saved Configuration	Disable
Name Configs	
Reset Cfg Names	
Mode	LinePrinter+
Host Interface	
Centronics	
Data Bit 8	Enable
PI Ignored	Enable
Data Polarity	Standard
Resp. Polarity	Standard
Busy On Strobe	Enable
Latch Data On	Leading
Prime Signal	Enable

Table 1. Factory and Configuration Parameters

Menu Item	Default Value
TOF Action	Reset
Buffer Size In K	64
Dataproducts	
Data Bit 8	Enable
PI Ignored	Enable
Data Polarity	Standard
Resp. Polarity	Standard
Latch Data On	Middle
Prime Signal	Disable
TOF Action	Reset
Buffer Size In K	64
Serial	
Interface Type	RS-232
Data Protocol	XON/XOFF
Baud Rate	9600 baud
Word Length	8
Stop Bits	64
Parity	None
Data Term Ready	True
Request To Send	On-line & BNF
Buffer Size In K	64
Poll Character	00 Hex
Poll Response	0 MS

Table 1. Factory and Configuration Parameters

Menu Item	Default Value
Idle Response	Disable
One Char Enquiry	Disable
IEEE 1284	
Prime Signal	Enable
TOF Action	Reset
Buffer Size in K	64
Ethernet	
Buffer Size in K	64
Auto Switching	
Parallel Hotport	
Port Type	Centronics
Trickle Time	1/4 sec.
Time Out	10 sec.
Report Status	Disable
Serial Hotport	
Port Type	RS-232
Trickle Time	1/4 sec.
Time Out	100 sec.
Report Status	Disable
Ethernet Params	NIC install only
IP Address	*xxx.xxx.xxx.xxx*
Gateway Address	*xxx.xxx.xxx.xxx*
Subnet Mask	*xxx.xxx.xxx.xxx*

Table 1. Factory and Configuration Parameters

Menu Item	Default Value
MAC Address	*hh.hh.hh.hh.hh.hh*
Novell Protocol	Enable
NetBIOS Protocol	Enable
Novell Frame	Auto Sensing
PPM Port Number	3001
PPM Port Timeout	10 secs.
Paper Control	
Paper Selection	Fanfold
Fanfold Options	
Image Width	14.6 inches
Form Length	11.0 inches
Paper Length	Auto. Select
Fanfold Output	Into Stacker
Burst on Eject	Enable
No Back Feed	Disable
Cut Sheet Options	
Cut Sheet Output	Face Down
Tray Linking	Disable
Variable Upper Tray Width	Disable
Variable Lower Tray Width	Disable
Variable Lower Tray Length	Enable
Horizontal Image Shift	0/100 inches

Table 1. Factory and Configuration Parameters

Menu Item	Default Value
Vertical Image Shift	0/100 inches
Toner	3
Reprint on Fault	Enable
Paper Type	Standard
Reset Toner Full	Press ENTER
Miscellaneous	
Panel Key Sound	On
Alarm	On
Power-up State	Online
Hex Dump Mode	Disable
PTX Setup Option	
Set Up Parse	Disable
Set Up SFCC	21 h
Display Language	English
File System	
Overwrite Files	Enable
View File List	File 1
Delete Files	File 1
Optimize and Reboot	
Print File List	

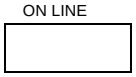
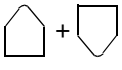
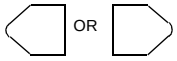
Table 1. Factory and Configuration Parameters

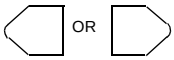
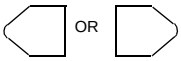
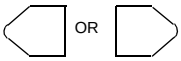
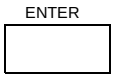
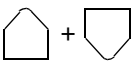
Menu Item	Default Value
Font Memory	
Max Cache Memory	900 KBytes
Max Cached Char	01 KBytes
Standard Chars.	340
Bold Chars.	448
Extra Bold Char.	504

Changing Printer Configurations

In order to properly configure the printer, it is important that you have a current configuration printout, as described previously. From this printout, determine which parameters you need to change for the printer to operate correctly with the host computer, or your specific applications.

To change printer settings such as paper length, emulation, and host I/O interface, do the following steps:

Step	Press	LCD Message
1. Place the printer offline.		OFFLINE CONFIG. CONTROL
2. Unlock the ENTER key.		ENTER SWITCH UNLOCKED
3. Scroll through the menu to access available parameters or submenus.		OFFLINE HOST INTERFACE

Step	Press	LCD Message
4. Select the menu to access available parameters or submenus.		HOST INTERFACE Centronics
5. Scroll through the parameters until you reach the one you want.		HOST INTERFACE Serial
6. Select this submenu parameter to access the value options.		Serial Interface Type
7. Scroll through the value options until you reach the desired value.		Serial Baud Rate
8. Select the parameter to access the value options.		Baud Rate 9600 BAUD*
9. Scroll through the parameter value options until you reach the desired value.		Baud Rate 38400 BAUD
10. Select the current value.		Baud Rate 38400 BAUD
11. Continue doing this to make other changes as needed. At any time press UP to return to a higher level.		
12. Lock the ENTER key.		ENTER SWITCH LOCKED

Step	Press	LCD Message
13. Do one of the following to save your changes: • To temporarily save the changes (until the printer is turned off), place the printer online. • To permanently save the changes, see the following section. Place the printer online.	ON LINE	ONLINE LINEPRINTER+

Saving Configurations

IMPORTANT **If you do not save your configuration, all of the new values will be lost when you turn off the printer.**

You can save up to eight different configuration sets to meet eight unique print job requirements. For example:

Config. 0: Factory Default (This cannot be altered)

Config. 1: Selects Image Width of 4 inches

Selects Paper Length of 10 inches.

Config. 2: Selects Image Width of 8 inches

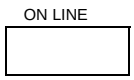
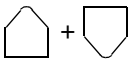
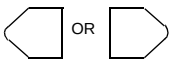
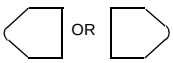
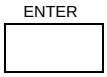
Selects Paper Length of 11 inches.

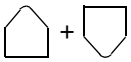
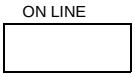
The configurations are saved and stored in flash memory for later use.

Configuration 0 is a factory-preset configuration that cannot be changed or saved.

Perform the following steps to save a new configuration:

NOTE: If the “Protect Config.” option is enabled, the new configuration is not saved unless the existing configuration has been deleted.

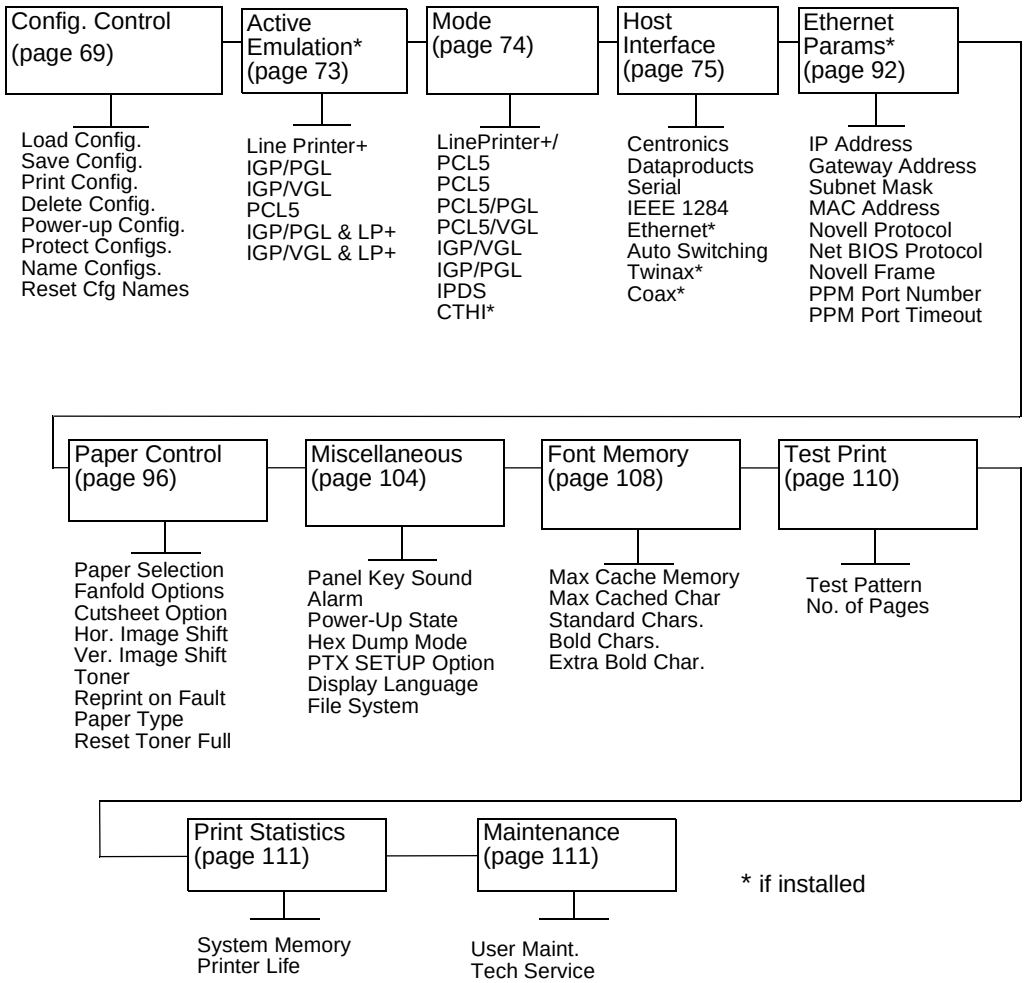
Step	Press	LCD Message
1. Place the printer offline.		OFFLINE CONFIG. CONTROL
2. Unlock the ENTER key.		ENTER SWITCH UNLOCKED
3. Select the Config. Control menu.		CONFIG. CONTROL Load Config.
4. Scroll through the Config. Control menu until you reach “Save Config.”		CONFIG. CONTROL Save Config.
5. Select Save Config.		Save Config. 1*
6. Scroll through the options (1-8) until you reach the desired value.		Save Config. 4
7. Select the current value. An asterisk appears next to it.		Save Config. 4*
• If the configuration number has been previously saved and the “Protect Config.” option is enabled, this error message appears briefly:		CFG FILE EXISTS DELETE FIRST
• If the configuration number has not been previously saved or the “Protect Config.” option is disabled, the STAND BY light flashes, and this message appears:		STANDBY...

Step	Press	LCD Message
		Save Config. 4*
8. Lock the ENTER key.		ENTER SWITCH LOCKED
9. Place the printer online (LCD depends on printer emulation).		ONLINE LINEPRINTER+

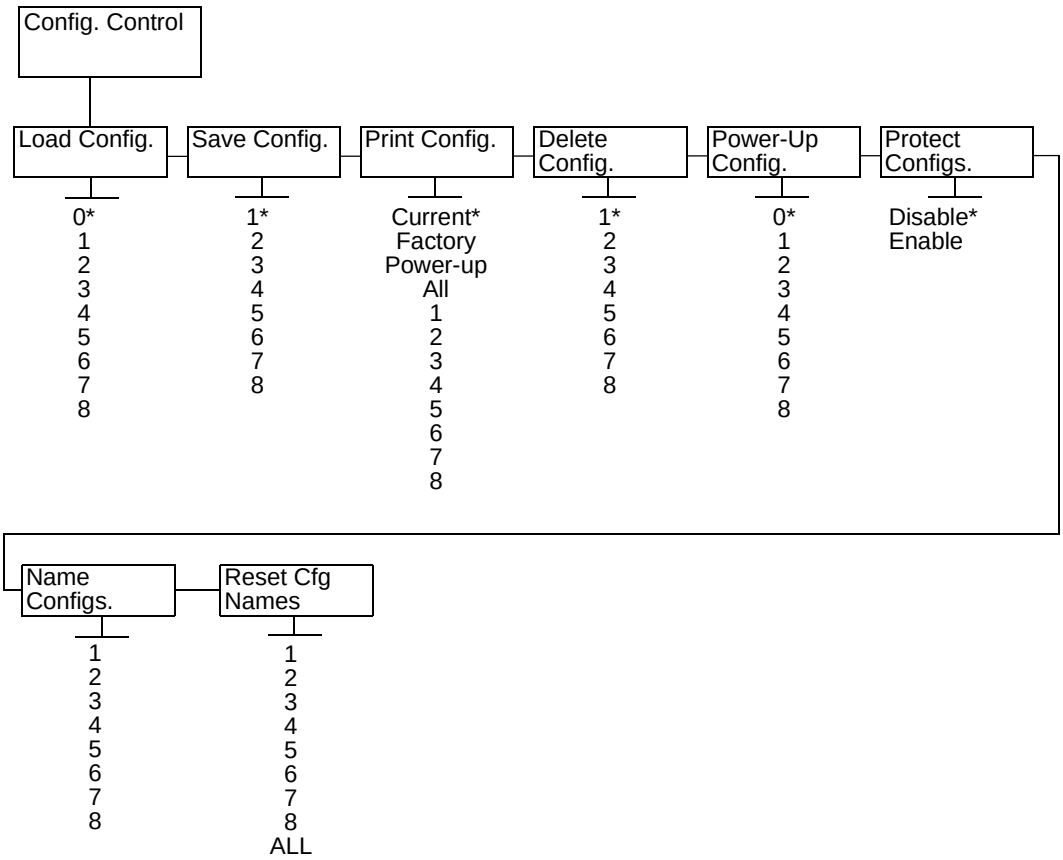
NOTE: If you want to make the new printer configuration active at power-up, select this configuration as the “Power-Up Config.”

Configuration Menus

The following pages describe the configuration menus and their options. For details on a particular menu, see the specified page.



Config. Control Menu



Load Configuration

The printer can store numerous configurations. This option allows you to select and load a specific configuration.

The factory default for loading is configuration 0. Note that configuration 0 is a factory-preset configuration that cannot be changed and is always available for loading.

Save Configuration

Save configuration allows you to save up to eight different configurations to meet different print job requirements.

Configuration 0 is a factory-preset configuration that cannot be changed or saved.

NOTE: If the “Protect Save CFG” option is enabled, the new configuration is not saved unless the existing configuration has been deleted.

Print Configuration

Print configuration allows you to output a listing of various stored printer configuration parameters. You can print the following configurations:

- Current
- Factory
- Power-up
- All
- Any of the customized configurations (1 through 8)

For details on making a configuration printout, see page 57.

NOTE: The information (Power-Up Time, Level A Pages, etc.) that is displayed on the LCD via the Print Statistics menu is printed only as part of the printout for the Current configuration. The Print Statistics information is not printed under any of the printouts for customized configurations. Thus, if you want to make a printout that includes the Print Statistics information, you must select either the “Current” configuration or “All” configurations from the Print Configuration menu. The Print Statistics menu is detailed on page 111.

Delete Configuration

Delete configuration allows you to delete a configuration file. You can delete one or all of your eight customized configurations.

Configuration 0 is a factory-preset configuration and cannot be changed or deleted.

Power-up Configuration

Power-up configuration allows you to specify one of nine (0-8) configurations to be used upon printer power-up. The factory default for power-up is configuration 0.

Protect Configs

The Protect Configs (protect saved configuration) option allows you to specify whether or not a new configuration should “overwrite” an existing configuration when you activate the “Save Config” option:

- When disabled (default), the new configuration overwrites the existing configuration. There is no protection set for the former configuration.
- When enabled, the new configuration does not overwrite the existing configuration, and the following is displayed:

  ```
  CONFIG. EXISTS
  DELETE FIRST
  ```

- Therefore, you must delete an existing configuration before trying to save a new configuration, as it is protected.

Name Configs

You may specify a 15 character name which can be used to identify a configuration. The name you enter for a configuration will be used in the Load Config., Save Config., Delete Config., and Power-Up Config. menus. The names can only be cleared by using the Reset Cfg Names Menu.

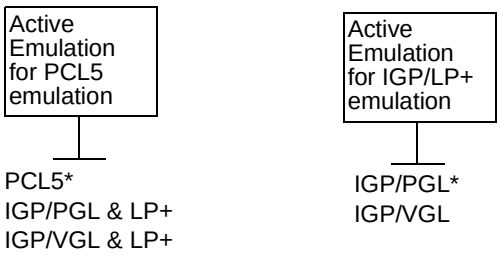
When you move into the Name Configs. menu, the top line of the display shows the current configuration name. The second line of the display is initially the same as the top line. You can modify the second line of the display without affecting the top line until the ENTER key is pressed, which sets the modified name.

Press the UP or DOWN (▲ or ▼) keys to cycle through the values available for that character at the cursor location. Press the NEXT (▶) key to move to the next character to be modified. Press the PREV key (◀) to go back to a character you have already modified. Continue until you have entered the name you want to give to this configuration, then press ENTER to save. The name you entered will now represent this configuration on the printer's front panel. To exit this menu without saving, press any key other than the ENTER key. The configuration name will revert to the last saved value.

Reset Cfg Names

You can reset specific configuration names back to the default value of the configuration number.

Active Emulation (If Installed)



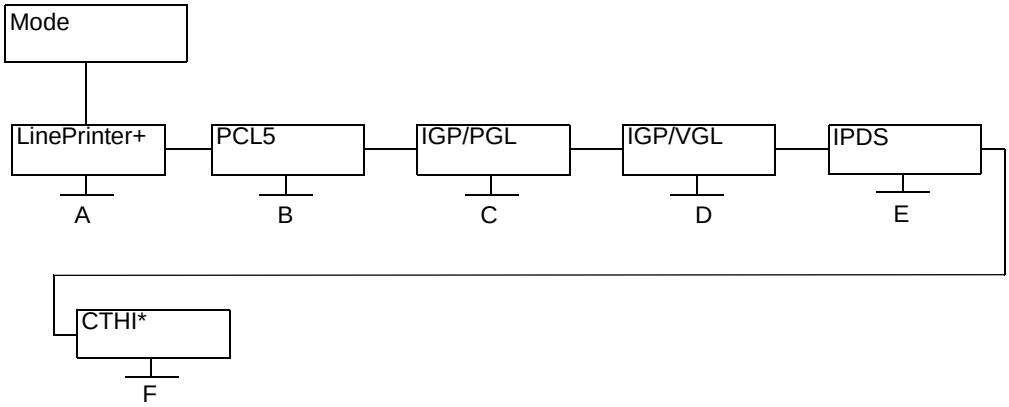
This ACTIVE EMULATION function allows the user to activate an emulation. There are two methods for selecting the desired emulation. The first is by selecting the emulation directly from the printer menu. The second is by sending a host command which will switch the emulation automatically (see the appropriate *Programmer's Reference Manual* for details).

The printer can contain more than one emulation at a time. These emulations are mutually exclusive and only one can be active at a time. The menu above selects the emulation to be active. The entries in this menu depend upon the options installed in the printer.

When changing from one emulation to another, the printer will load the power-up configuration. Thus, any configuration settings done before selecting these emulations and not saved in NVRAM will be lost.

IMPORTANT **In order to configure an emulation, that emulation must be selected in the ACTIVE EMULATION menu; other emulations not selected will not appear in the menu.**

Mode Menu



See also the following documents:

A. *LinePrinter Plus Emulation for LaserLine Printers Programmer's Reference Manual*

B. *PhoenixPage PCL5 Emulation Operator's Guide*

C. *IGP/PGL Emulation for LaserLine Printers Programmer's Reference Manual*

D. *IGP/VGL Emulation for LaserLine Printers Programmer's Reference Manual*

E. *IPDS Laser Printer Emulation Programmer's Reference Manual*

F. *CTHI Laser Printer Emulation Programmer's Reference Manual*

NOTE: The order and number of options displayed in this menu structure varies depending on the emulations that are installed.

"Mode" refers to the emulation software that you use. Your printer comes equipped with the Printronix LinePrinter Plus emulation software (which emulates an impact printer). The IGP/PGL, IGP/VGL, IPDS, CTHI, and PhoenixPage PCL5 software emulations are available as options.

When you turn on the printer, it reads the Flash memory as part of its initialization, to determine what emulations are installed. Based on this information, the printer then creates the appropriate selections on the Mode menu. During power-up, the printer also loads the power-up set of configuration values. The power-up set is the same as the factory set until you save a new set to the power-up configuration.

NOTE: Each emulation can have its own set of configuration options in addition to those that are in the printer system list. For information on these unique configuration settings, see the appropriate emulation manual.

Host Interface Menu

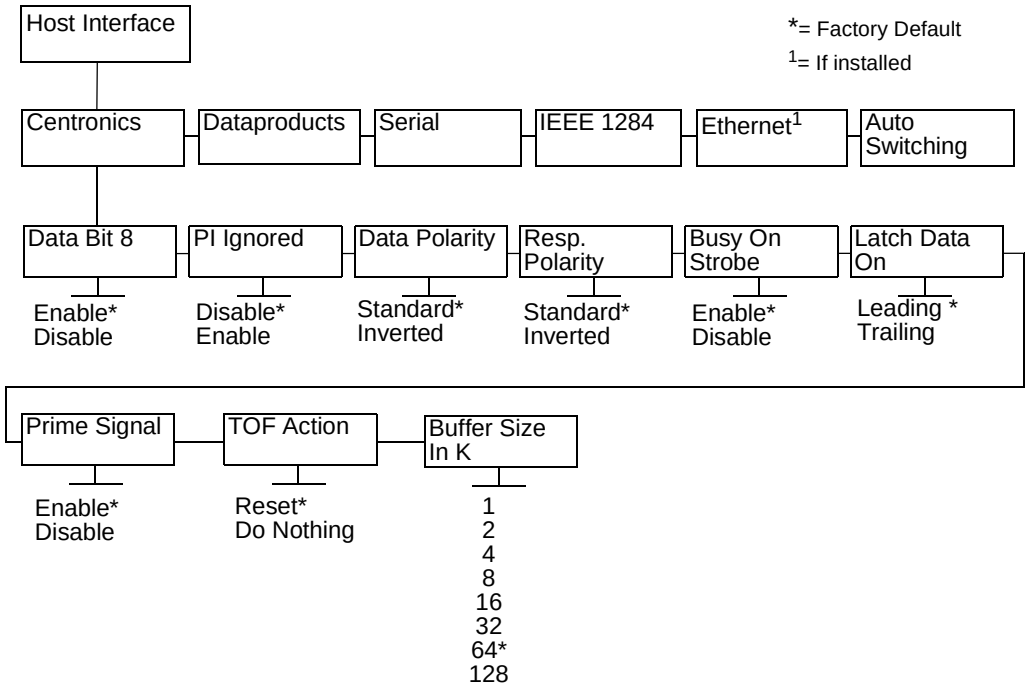
The printer provides the following host interface options:

- Centronics® parallel
- Dataproducts® parallel (requires optional cable adapter, p/n 703316-001)
- Serial (RS-232 or RS-422)
- IEEE 1284 parallel
- Ethernet (if installed)
- Coax/Twinax (if installed)
- Auto Switching

The configuration options for each interface type are shown in the illustrations on the following pages. Descriptions of the options follow each illustration. Set these options to meet the specific data communication requirements of the host computer as well as the application running on the host.

NOTE: For additional host interface signal information, see Appendix C, on page 257.

Centronics Parameters



Data Bit 8

- **Enable**. Allows access to the extended ASCII character set.
- **Disable**. The printer interprets bit 8 of each incoming data character as a zero, regardless of its actual setting.

PI Ignored

The PI (Paper Instruction) signal is used to control vertical paper motion.

- **Enable**. Ignores the PI signal and treats the data as characters or control codes
- **Disable**. Causes the printer to interpret the eight data lines as VFU commands when the PI signal is true.

Data Polarity

The Data Polarity parameter must be set to match the data polarity of your host computer.

- **Standard**. Does not expect the host computer to invert the data.
- **Inverted**. Expects the data received on the data lines from the host computer to be inverted. Ones become zeros, and vice versa.

Resp. Polarity

The Response Polarity parameter must be set to match the response polarity of your host computer.

- **Standard**. Does not invert the response signal.
- **Inverted**. Inverts the response signal sent to the host computer.

Busy On Strobe

- **Enable**. Asserts a busy signal after each character is received.
- **Disable**. Asserts a busy signal only when the print buffers are full.

Latch Data On

Specifies whether the data is read on the leading (default) or trailing edge of the data strobe signal.

Prime Signal

- **Enable.** The parallel port will do a warm start (reboot) when the host asserts the Prime Signal.
- **Disable.** The parallel port will not do a warm start when the host asserts the Prime Signal.

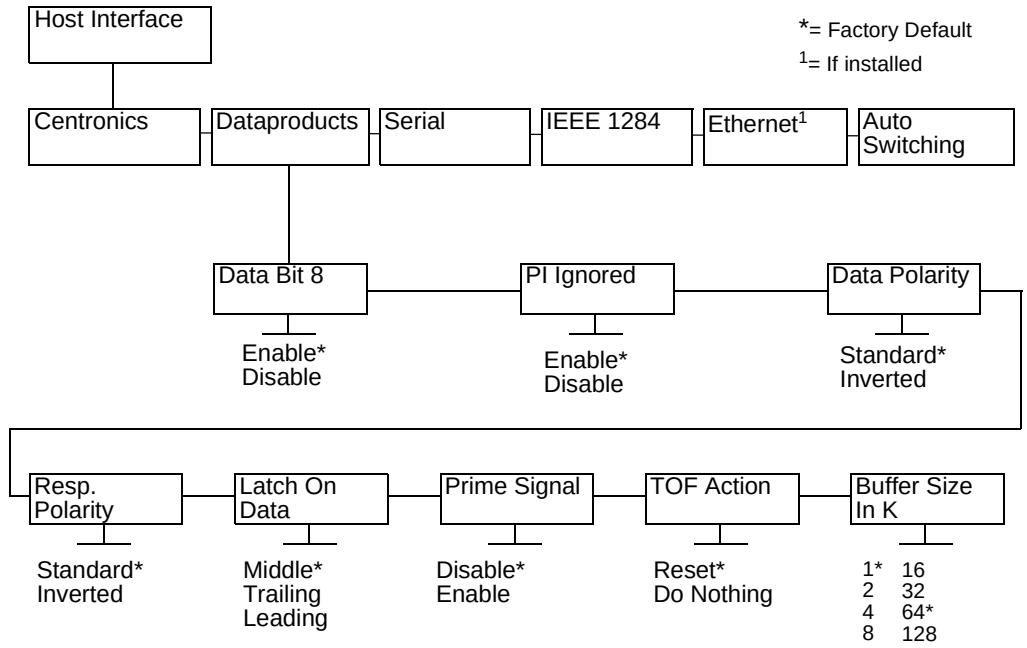
TOF Action

- **Reset.** A form feed is performed before a warm start when the Prime Signal is asserted from the host. This setting is only used if the Prime Signal parameter is enabled.
- **Do Nothing.** Nothing occurs before a warm start when the Prime Signal parameter is asserted.

Buffer Size In K

Configures the amount of memory allocated for the Centronics parallel port buffer. You can specify between 1 and 128 Kbytes.

Dataproducts Parameters



Data Bit 8

- **Enable.** Allows access to the extended ASCII character set.
- **Disable.** The printer interprets bit 8 of each incoming data character as a zero, regardless of its actual setting.

PI Ignored

The PI (Paper Instruction) signal is used to control vertical paper motion.

- **Enable.** Ignores the PI signal and treats the data as characters or control codes
- **Disable**. Causes the printer to interpret the eight data lines as VFU commands when the PI signal is true.

Data Polarity

The Data Polarity parameter must be set to match the data polarity of your host computer.

- **Standard.** Does not expect the host computer to invert the data.
- **Inverted**. Expects the data received on the data lines from the host computer to be inverted. Ones become zeros, and vice versa.

Resp. Polarity

The Response Polarity parameter must be set to match the response polarity of your host computer.

- **Standard.** Does not invert the response signal.
- **Inverted**. Inverts the response signal sent to the host computer.

Busy On Strobe

- **Enable.** Asserts a busy signal after each character is received.
- **Disable.** Asserts a busy signal only when the print buffers are full.

Latch Data On

Specifies whether the data is read in the middle (default), on the leading or trailing edge of the data strobe signal.

Prime Signal

- **Enable.** The parallel port will do a warm start (reboot) when the host asserts the Prime Signal.
- **Disable.** The parallel port will not do a warm start when the host asserts the Prime Signal.

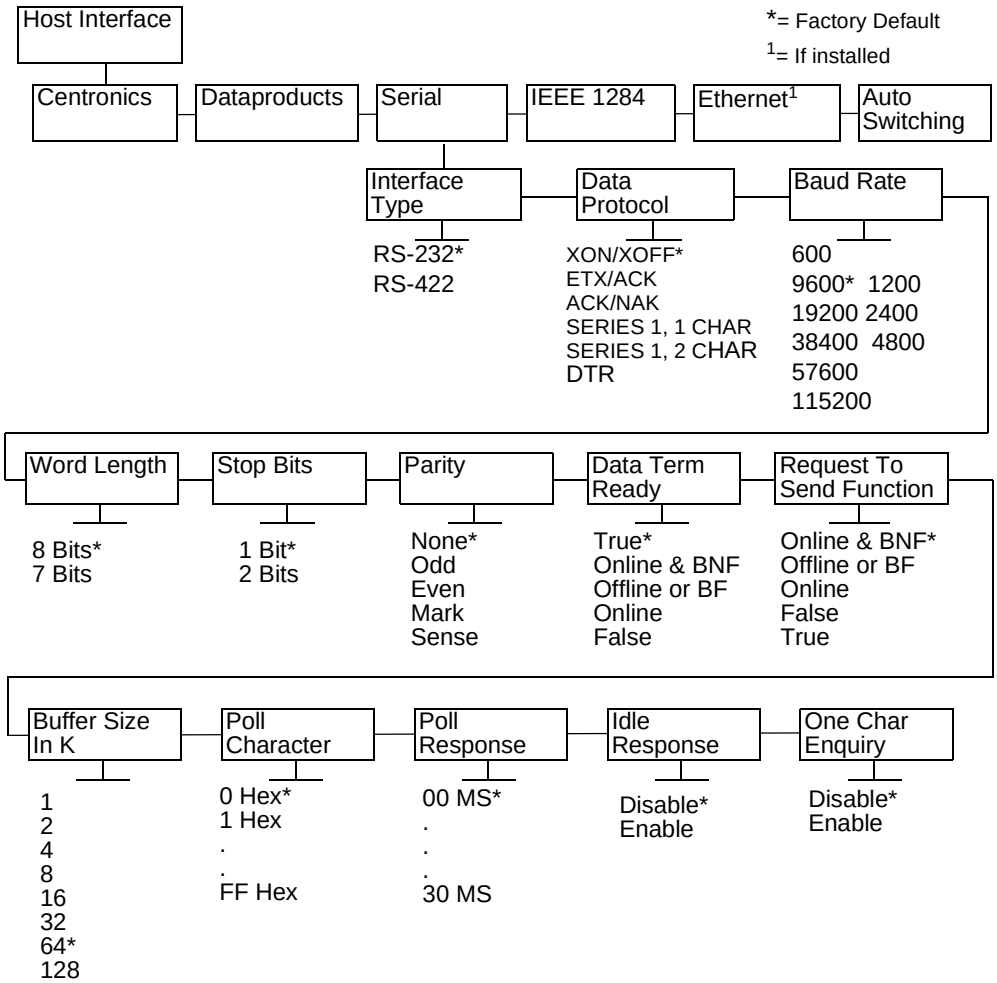
TOF Action

- **Reset.** A form feed is performed before a warm start when the Prime Signal is asserted from the host. This setting is only used if the Prime Signal parameter is enabled.
- **Do Nothing.** Nothing occurs before a warm start when the Prime Signal parameter is asserted.

Buffer Size In K

Configures the amount of memory allocated for the Dataproducts parallel port buffer. You can specify between 1 and 128 Kbytes.

Serial Parameters - RS-232 & RS-422



Data Protocol

The Data Protocol parameter allows you to select the software flow control protocol used for communications between the printer and the host computer. You can also turn off software flow control.

Values: XON/XOFF, ETX/ACK, ACK/NAK, SERIES 1, 1 CH, or SERIES 1, 2 CH, DTR.
This parameter must be set to match your host computer.

The actions for each of the seven possible parameter values are as follows:

XON/XOFF (Default)

When you select the XON/XOFF protocol, the printer does the following:

- When not ready to receive data (i.e., offline or full data buffer), the printer sends ASCII code DC3 (Device Code 3, hex 13, XOFF) to the host.
- When ready to receive data (i.e., online and empty data buffer), the printer sends ASCII code DC1 (Device Code 1, hex 11, XON) to the host.

NOTE: XON means “transmit on;” XOFF means “transmit off.”

ETX/ACK

The ETX/ACK protocol enables the flow of communication to the printer by sending a block of data, and ending the block with an End of Text (ETX) signal. When the printer receives the ETX signal, it acknowledges the signal, thereby indicating it has received the entire block of data.

ACK/NAK

The ACK/NAK protocol gives the printer a means to acknowledge it has either accepted a transmission (ACK) or did not receive a transmission (NAK).

SERIES 1, 1 CH

When you select the Series 1 with 1 Character protocol, the printer does the following:

- When not ready to receive data (buffer 75% full), the printer sends a buffer full response character to the host.

- When ready to receive data (buffer drops to 50% full), the printer sends a buffer empty response character to the host.
- If the buffer ever fills completely, the printer sends a buffer full response character to the host every time it receives a character from the host.
- In addition, whenever the printer state changes from online to offline (or vice-versa), the printer sends the appropriate response character to the host.

The printer uses different response characters to represent buffer full and buffer empty, depending on whether it is online or offline. These response characters are listed in the following table:

Online State	Buffer State	Response Character
Online	Buffer Empty	CR
	Buffer Full	3
Offline	Buffer Empty	0
	Buffer Full	2

With the SERIES 1, 1 CH protocol selected, if the printer receives a Series 1 poll character from the host, the printer removes the poll character from its input data stream and discards it. After a delay, called the poll delay, the printer replies to the host by sending the appropriate response character, per the preceding table.

During a poll delay, if the printer receives another poll character, the printer merely discards it. However, if a transition (from buffer full to buffer empty or from online to offline) occurs during a poll delay, the printer sends the response character appropriate to the new printer state at the end of the delay.

If you enable the Series 1 Idle parameter, then whenever the buffer is less than 75% full, the printer sends a response character to the host every two seconds.

You can select the poll character and the poll delay time from the printer control panel. You can also enable or disable Series 1 Idle from the control panel. Descriptions of these parameters start on page 83.

NOTE: When using the SERIES 1, 1 CH protocol, be careful with the transmission of binary data (control codes, bit images, etc.) since the printer discards poll characters.

SERIES 1, 2 CH

When you select the Series 1 with 2 Characters protocol, the printer behaves exactly the same as the Series 1 with 1 Character protocol, except that the printer sends two-character responses to the host. These response characters are listed in the following table:

Online State	Buffer State	Response Characters
Online	Buffer Empty	1 CR
	Buffer Full	3 CR
Offline	Buffer Empty	0 CR
	Buffer Full	2 CR

NOTE: When using the SERIES 1, 2 CH protocol, be careful with the transmission of binary data (control codes, bit images, etc.) since the printer discards poll characters.

DTR Protocol

The printer controls the data flow by sending this hardware signal to the host. If there is enough room in the printer buffer, the printer will send a high signal; if the buffer is full, the printer will send a low signal. DTR tells the host if it is safe to send more data. (If the host sends data during an unsafe condition, data will be lost.) DTR is not available when RS-422 is selected.

Baud Rate

Sets the baud rate of the serial interface in the printer. Baud rate is the speed at which serial data is transferred between the host computer and the printer. The choices for the RS-232 and RS-422 interfaces are 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 115,200 Baud.

NOTE: If you select a baud rate that is greater than 19200, you will need to use RS-422 to prevent data loss.

Word Length

Sets the length of the serial data word. The length of the data word can be set to 7 or 8 bits, and much match the corresponding data bits setting in the host computer.

Stop Bits

Values: 1 (default) or 2.
This parameter must be set to match your host computer.

Stop bits signal the end of a transferred serial data word.

Parity

Values: None (default), Odd, Even, Mark and Sense.
This parameter must be set to match your host computer.

The host may send a parity bit with every data word. The parity bit is used for error checking.

Data Term Ready

Values: Online & BNF, True (default), False, Offline or BF, or Online.
This parameter must be set to match your host computer.

The DTR Function parameter is part of hardware flow control. This parameter determines when the printer generates the Data Terminal Ready (DTR) signal to the host computer. DTR is a status signal that the printer sends to the host to indicate whether or not the printer is ready to receive data.

- The True parameter setting causes the printer to continuously assert the DTR signal.
- The False setting causes the printer to never assert the DTR signal.
- The Online & BNF (buffer not full) setting causes the printer to assert the DTR signal only when the printer is online and its internal serial buffer is not full.
- The Offline or BF (buffer full) asserts the DTR signal when the printer is off-line or the internal serial buffer is full.
- The Online setting causes the printer to assert the DTR signal whenever either the printer is online.

Request To Send

Values: Online & BNF (default), True, False, Offline or BF, or Online.
This parameter must be set to match your host computer.

The Request To Send parameter is part of hardware flow control. This parameter determines when the printer generates the Request to Send (RTS) signal to the host computer. RTS is a status signal that the printer sends to the host to indicate whether or not the printer is ready to receive data.

- The True parameter setting causes the printer to continuously assert the RTS signal.
- The False setting causes the printer to never assert the RTS signal.
- The Online & BNF (buffer not full) setting (the default setting) causes the printer to assert the RTS signal only when the printer is online and its internal serial buffer is not full.
- The Offline or BF (buffer full) asserts the RTS signal when the printer is off-line or the internal serial buffer is full.
- The Online setting causes the printer to assert the RTS signal whenever the printer is online.

Buffer Size In K

Value: 1 - 128.

This parameter reflects the size in K of the printer's data buffer.

Poll Character

Values: The allowable range is hex 0 through FF. The default value for this parameter is 0.

This parameter selects the character that the printer recognizes as the Series 1 poll character.

NOTE: This parameter is used only with the SERIES 1, 1 CH and SERIES 1, 2 CH protocols. See page 83 for more information.

Poll Response

Values: 0 to 30 MS. The default value for this parameter is 0+ Msec.

This parameter selects the Series 1 delay time, in milliseconds, that the printer waits prior to sending the Series 1 response to the host.

NOTE: This parameter is used only with the SERIES 1, 1 CH and SERIES 1, 2 CH protocols. See the description of the Data Protocol menu option on page 83 for more information.

Idle Response

Values: Enable or Disable. The default value for this parameter is Disable.

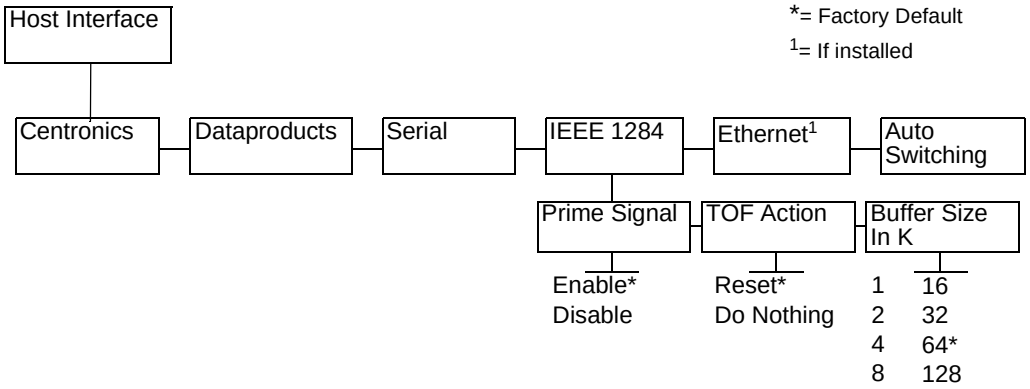
If you enable the Series 1 Idle parameter, then whenever the buffer is less than 75% full, the printer sends a response character to the host every two seconds.

NOTE: This parameter is used only with the SERIES 1, 1 CH and SERIES 1, 2 CH protocols. See page 83 for more information.

One Char Enquiry

The One Char Enquiry mode uses the Poll Character to detect a request from the host and sends a response back to the host. This option also allows you to turn this feature on and off. The default is disabled.

IEEE 1284 Parallel Parameters



The IEEE 1284 interface is faster and more versatile than that of the Centronics interface and supports bidirectional communication. Configuration of this interface is controlled from the host.

Prime Signal

- **Enable**. This parallel port will perform a warm start (reboot) when the host asserts the Prime Signal.
- **Disable**. This parallel port will not perform a warm start (reboot) if the host asserts the Prime Signal.

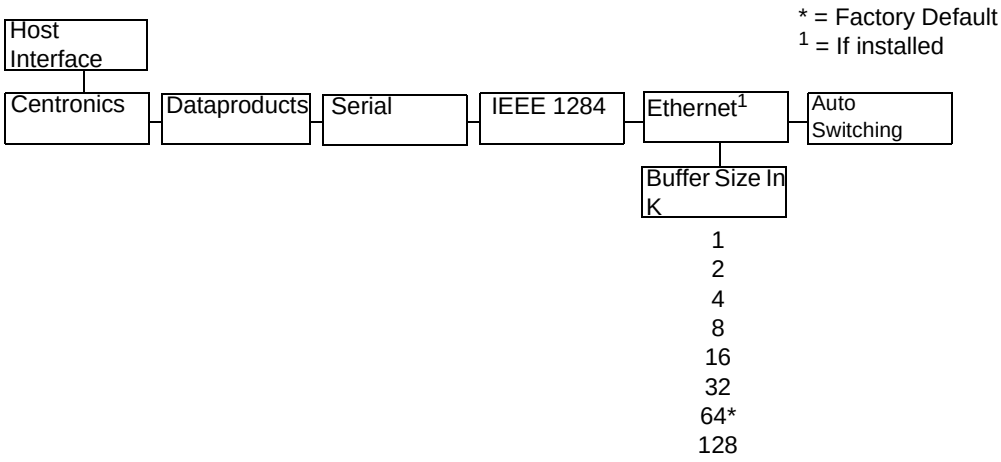
TOF Action

- **Reset**. A form feed is done before a warm start when the Prime Signal is asserted from the host. This setting is used only if the Prime Signal parameter is enabled.
- **Do Nothing**. Nothing occurs before a warm start when the prime signal is asserted from the host.

Buffer Size In K

This option configures the amount of memory allocated for the IEEE 1284 parallel port buffer. You can specify between 1 and 128 Kbytes.

Ethernet Submenu

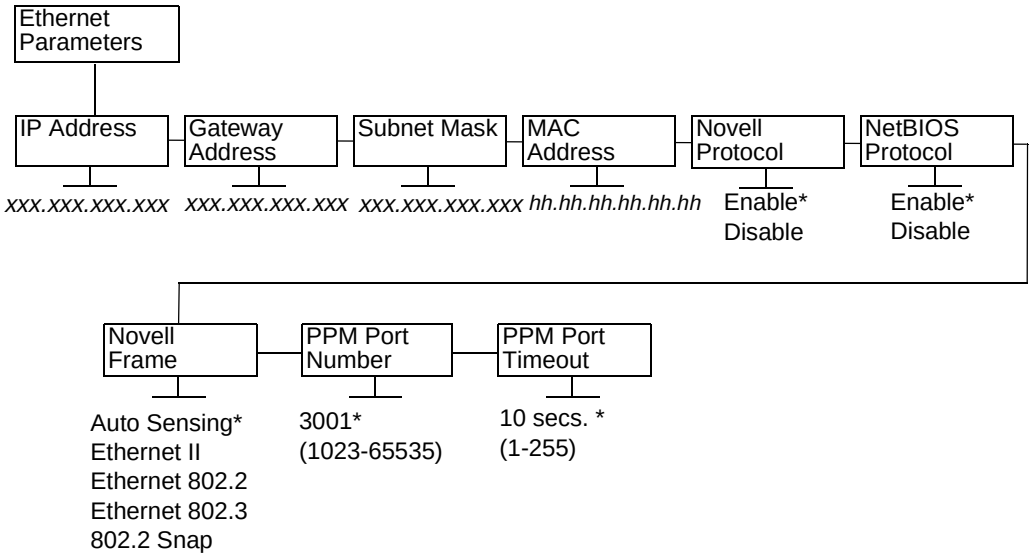


The Ethernet interface allows you to locate the printer on a LAN rather than attach the host directly into the printer. The detailed configuration of this option is given in the *PrintNet User's Manual*.

Buffer Size In K

This option configures the amount of memory allocated for the Ethernet buffer. You can specify between 1 and 128 Kbytes.

Ethernet Parameters (If Installed)



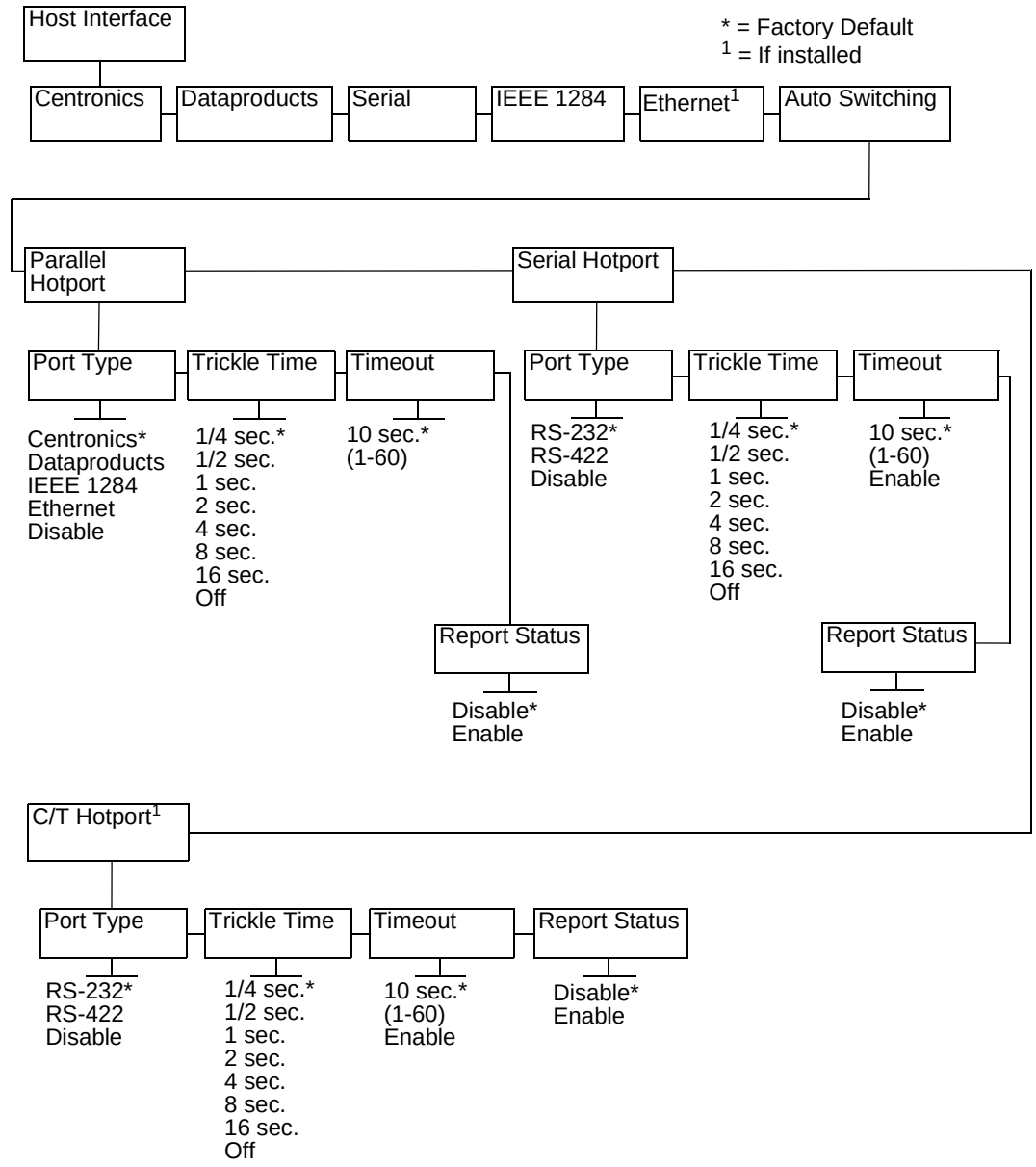
The ETHERNET PARAMS menu enables you to set up your printer so it can communicate on a network.

For information on assigning the IP Address, Gateway Address, Subnet Mask and MAC Address, refer to the *PrintNet User's Manual*.

You may also enable or disable the Novell or NetBIOS Protocols within this menu, as well as selecting which Novell Frame scheme is used in processing Novell signals. See the Novell chapter in the *PrintNet User's Manual* for more details.

If the printer is connected to a Printer Manager utility, the PPM Port number and PPM Port Timeout settings must match the settings in the Printer Manager program. See the appropriate Printer Manager manual for details.

Auto Switching Parameters



Auto Switching

Gives the printer the ability to handle multiple data streams simultaneously. With Auto Switching, the printer can service hosts attached to the serial and parallel ports as if they were the only interface connected.

For example, if the host computer sends one print job to the RS-232 serial port and a separate print job to the IEEE 1284 parallel port, the printer's Auto Switching is able to handle both jobs, in the order they were received, without the user having to reconfigure the selected interface between jobs. The hotports are Parallel and Serial.

Port Type

Select the types of parallel and serial interfaces which are connected to the printer. For example, if your printer is attached to one host with a Centronics connection and a second host with an RS-422 serial connection, you would select Centronics under the Parallel Hotport menu, RS-422 under the Serial Hotport menu.

Trickle Time

When the printer is printing data from a host and a second job is received by the printer from a different host, Trickle Time prevents the second host from timing out while it is waiting for its data to be printed. In order to support this feature, the port has to be able to accept data from the host and store it for future use.

For example, if the printer is printing a job from the serial port, and then receives a second print job from the parallel port, the data from the parallel port will "trickle" bit by bit into the printer buffer to prevent a timeout error from being sent back to the host connected to the parallel port.

The selected value is the time that the printer waits before getting the next byte of data from the host. The Trickle Time value should be less than the host time out value, but not too much shorter or else the printer fills up its buffer too fast.

Timeout

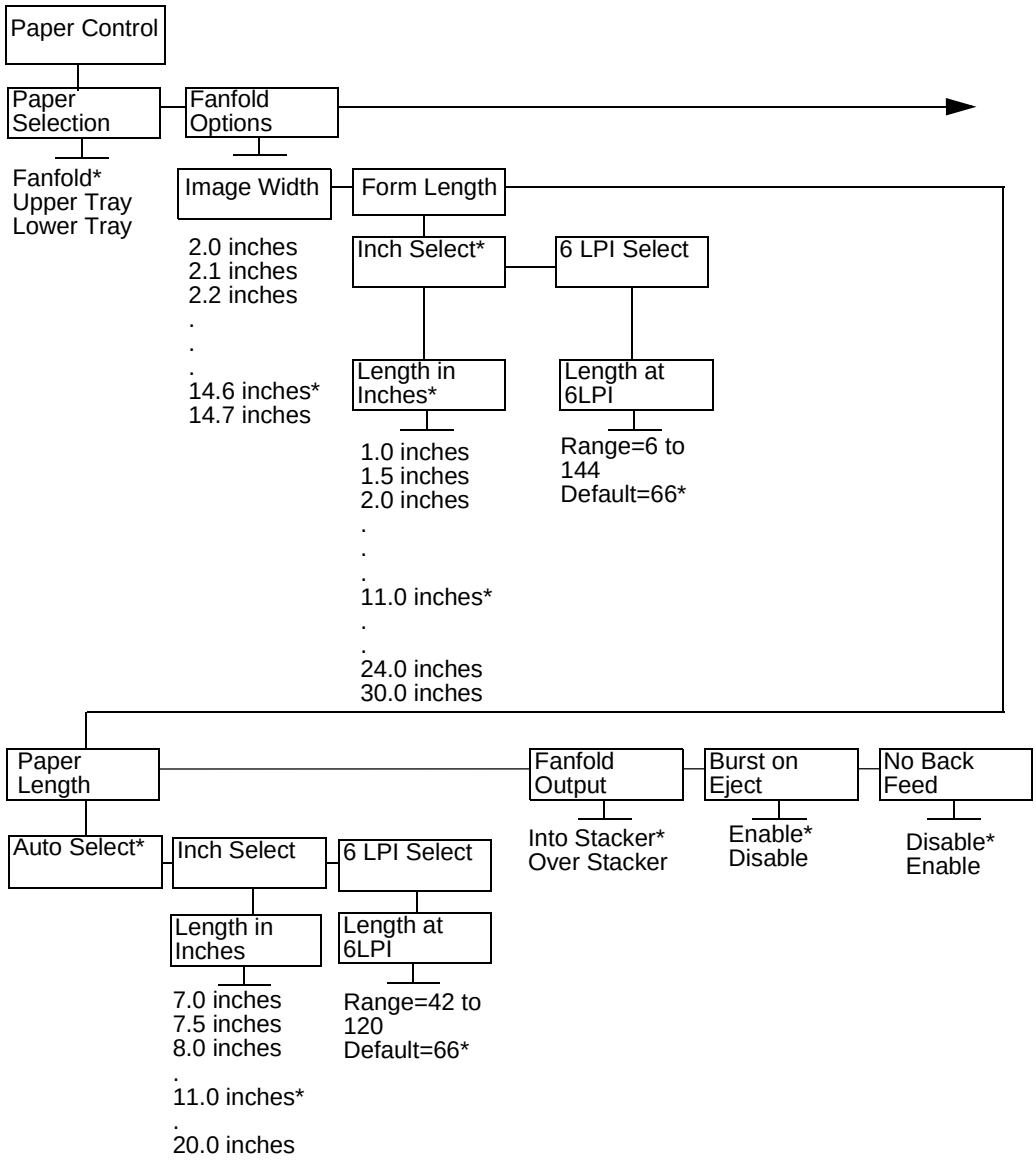
This is the value used by the printer to time out from the current port and check the other selected Port Types for data to print. When the printer has not received data from the host after a certain period of time, it needs to Timeout in order to service the other ports.

Report Status

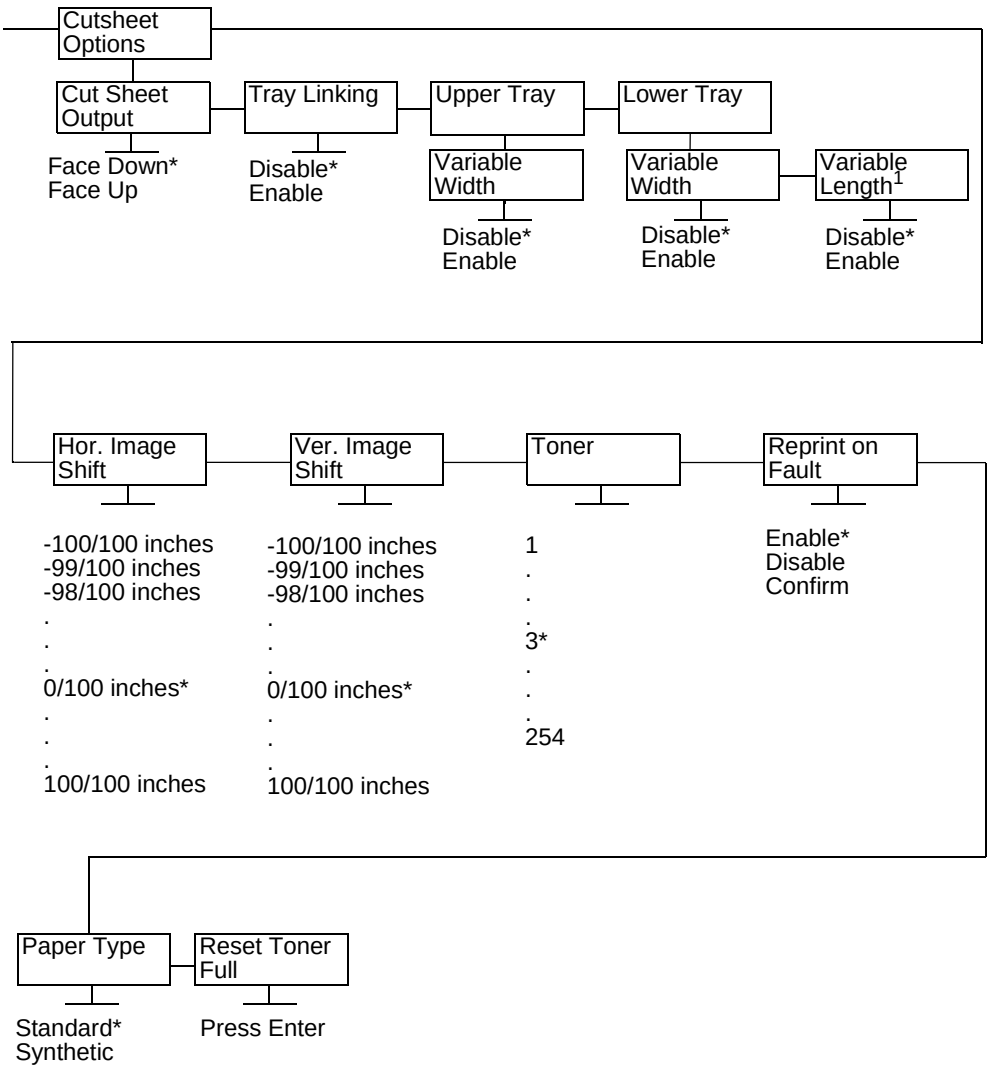
- **Disable** When a fault occurs on the printer, only the active port reports the fault to the host.
- **Enable** The port will report any fault even when it is not the current active port.

Paper Control Menu

Paper Control Menu



[1] = Variable Length menu only appears if modified tray is installed



Paper Selection

Paper selection specifies the type of paper and, for the cut sheet option, the cassette to be used. You may select fanfold (factory default) paper, or the upper or lower cassette, which holds various sizes of cut sheet paper.

Fanfold Options

Image Width

Image Width specifies the width of the image to be printed. The allowable range is 2.0 to 14.7 inches, in 0.1 inch increments. The factory default is 14.6 inches.

Form Length

Form Length is the logical form length for fanfold paper. You can specify the form length in either of two ways: in inches, or in the number of print lines (at six lines per inch).

- Inch Select/Length in Inches (the default). This selection allows you to set the form length in inches. The range is from 1.0 to 30.0 inches, in one-half inch increments. The default is 11.0 inches.
- 6 LPI Select/Length at 6LPI. This selection allows you to set the form length in lines. The range is from 6 to 180 in one line increments. The default is 66 lines.

Paper Length

Paper Length is the physical form length for fanfold paper (the vertical perforation to perforation distance). You can specify the paper length in three ways: Auto Select, inches, or the number of print lines (at six lines per inch).

- Auto Select (the default). Using this, the printer uses the current setting of the “Form Length” parameter to find the best physical paper length within the valid range, and then use that value. If the form length parameter setting is within the valid range for the paper length parameter, the printer uses the value for both the form length and paper length parameters.

If the form length parameter is outside the valid range for the paper length parameter, the printer finds a multiple or divisor of the form length parameter closest to 11 inches.

For example, a form length parameter setting of 10 inches results in a paper length setting of 10 inches, as 10 inches is within the valid range for form length and paper length parameters. A form length setting of 24 inches results in a paper length setting of 12 inches, as 24 is above the valid range. A form length setting of five inches results in a paper length setting of 10 inches, as five is below the valid range.

- Inch Select/Length in Inches. This allows you to set the paper length in inches. The range is 7.0 to 20.0 inches, in one-half inch increments. The default is 11.0 inches.
- 6 LPI Select/Length at 6LPI. This menu selection allows you to set the paper length in lines. The range is from 42 to 120 lines, in 1 line increments. The default is 66 lines.

Fanfold Output

The Fanfold Output option specifies the paper path through the stacker. You can select either into the stacker (default) or to bypass the stacker.

Burst On Eject

Burst on Eject allows you to use roll-feed paper that cannot be cut (separated) or parked (backed out of the print engine).

- With fanfold paper, whenever you change the page size or press the PAGE EJECT key, the printer automatically separates the currently loaded paper at the perforation, and backs the unprinted paper out of the engine.
- With roll-feed paper, the printer cannot separate the paper because there are no perforations. Burst on Eject must be set to Disable. The perforations separator is not used, and paper is never rolled back out of the engine. If you need to remove the paper before the entire roll is used, it must be manually removed.

When Burst on Eject is disabled, note the following effects:

- PAGE EJECT: When you press PAGE EJECT or send a ~PAGE EJECT command, the paper is not separated and is not rolled back into the printer. Instead, enough forms are inserted to fuse and move all pages physically out of the printer. The exact distance depends on the current Paper Length selection. The paper moves a minimum of 25.5 inches.

  Note that the printer uses Paper Length and not Form Length for paper motion. If the current Form Length is not a multiple of 1/6 inch, the exact distance the paper is moved is not a multiple of the form size. When using a preprinted roll-feed form, the physical top-of-form may be lost.

- FORM SIZE CHANGE: A form size change operates the same as pressing the PAGE EJECT key. Instead of separating the form, enough form feeds are inserted to move the printed pages out of the printer.

No Back Feed

No Back Feed automatically disables (default) or enables back feeds.

Cutsheet Options

Cut Sheet Output

Cut Sheet Output specifies which output tray is used. You may select the face down (default) or face up orientation. The face down tray is located on the top of the printer, the face up tray is located above the optional power stacker.

NOTE: If you select the face up tray, the first page printed is on the bottom of the stack, and the last page printed is on the top of the stack.

The Cut Sheet Output menu option is used only if the printer has the cut sheet paper feed option installed.

Tray Linking

With tray linking enabled, when the active cut sheet paper tray (cassette) runs out of paper, the printer switches automatically to the other cut sheet paper tray, and continues printing. The default is disable.

NOTE: Disable Tray Linking if the two cut sheet paper trays are of different sizes.
If the cut sheet trays are of different sizes, and Tray Linking is enabled, the printer will not switch to the alternate tray when the first tray runs out of paper. The printer also will not display the usual “CUT-SHEET PAPER EMPTY” message on the LCD. Instead, the printer stops printing and displays the message “TRAY MISMATCH.”
To clear this message, either add paper to the active tray, or insert a matching tray in the alternate tray position. Press CLEAR on the control panel.

Variable Tray Width

With Variable Tray Width, it is possible to override the standard cut sheet paper tray widths. Using Variable Tray Width and modified paper trays, it is possible to use non-standard paper stock that is a different width than standard paper widths.

You can independently adjust the upper and lower tray widths in the menus. To adjust the width of the top tray, select Variable Tray Width from the Upper Tray Width menu. To adjust the width of the bottom tray, select Variable Width from the Lower Tray Width menu. Each tray width is adjustable from 7.0 inches to 12.0 inches, in 0.1 inch increments.

NOTE: The Variable Tray Width feature requires modified paper trays. Do not change the Variable Tray Width menu settings unless you are using a modified paper tray.
Also, you cannot modify the width for a standard cut sheet tray. The width depends on the cassette paper size and is recognized by the printer using the paper size detector sensors.

"Tray Width" here is defined as the edge of the paper parallel to the drum. If the paper tray is set for Letter size or A4 size, the Variable Tray Width setting in the menus must be greater than the length.

Variable Tray Length

With Variable Tray Length, it is possible to override the standard cut sheet paper tray lengths. Using Variable Tray Length and modified paper trays, it is possible to use non-standard paper stock that is a different length than standard paper lengths.

You can independently adjust the lower tray length in the menus. To adjust the length of the bottom tray, select the Variable Length from the Lower Tray Length menu. The tray length is adjustable from 8.3 inches to 19.6 inches, in 0.1 inch increments.

NOTE: The variable Tray Length feature requires modified paper trays. You cannot change the Variable Tray Length menu settings unless you are using a modified paper tray. Also, you cannot modify the length for a standard cut sheet tray. The length depends on the cassette paper size and is recognized by the printer using the paper size detector sensors.

Horizontal Image Shift

Horizontal Image Shift specifies the amount to shift an image to the right for precise positioning on the page. The actual width of the image is not affected. The allowable range is -1.0 to 1.0 inches, in 1/100 inch increments. The default is 0.0 inches.

Vertical Image Shift

Vertical Image Shift specifies the amount to shift an image down for precise positioning on the page. The actual height of the image is not affected. The allowable range is -1.0 to 1.0 inches, in 1/100 inch increments. The default is 0.0 inches.

Toner

The Toner option sets the frequency interval for dispensing toner. The higher the number selected, the less frequently toner is dispensed. The allowable range is from 1 to 254. The default is 3.

Reprint On Fault

Reprint on Fault enables (default) or disables automatic reprinting after a fault condition occurs. If Confirm is selected, the printer returns a message asking if you want to reprint.

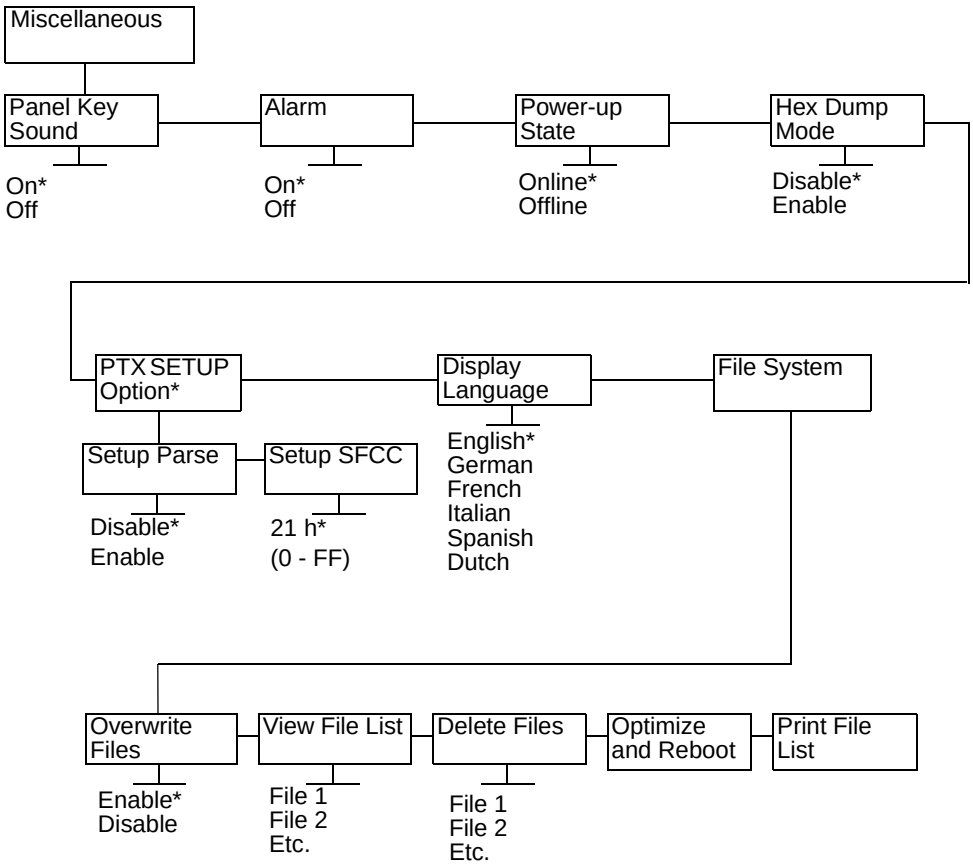
Paper Type

Paper Type allows you to set the printer for either standard or synthetic paper. The default is Standard; use this setting for most types of media. Use the Synthetic setting for special types of media such as plastic cards.

Reset Toner Full

Press ENTER to reset the “RESET TONER FULL” message.

Miscellaneous Menu



Miscellaneous Menu

Panel Key Sound

Panel key sound allows you to configure the printer to beep when you press a key (switch). The default setting is On.

Alarm

Alarm allows you to configure the printer to beep when a printer fault condition occurs. The default setting is On.

Power-up State

Power-up state allows you to configure the printer to power up in the offline or online state. The default setting is Online.

Hex Dump Mode

Hex dump mode allows you to place the printer into the “hex dump” mode, in which the printer outputs a hexadecimal data stream. The purpose of hex dump mode is to see exactly what data is received by the printer, in order to debug forms, for example.

When enabled, the hex dump mode translates all host interface data to its hexadecimal equivalent, then prints the hex code and its printable symbol, if one exists. Figure 5 shows a partial example of a hex dump.

After the printer enters hex dump mode, all characters it prints (including any in the printer's input buffer) are printed in two forms: as a two-symbol hexadecimal code, and as the character's printable symbol (if it has one). A nonprintable code is printed as a period [.] symbol. Up to 16 characters can be printed per line of hex dump printout. While the printer is in hex dump mode, it does not act upon any control codes, other than to print their hexadecimal equivalents.

The 16 characters printed per line on the hex dump are formatted so that the 16 printable symbols are printed in columns 1 through 16. The 17th column is blank. Column 18 contains either a p (PI line active) or a blank (PI not active). Columns 19 and 20 contain the hexadecimal code for the first character, followed by a blank. The PI line condition and hexadecimal code for the second character are printed in columns 22, 23, and 24, followed by a blank. The third through 16th characters are printed in a similar manner. The hexadecimal code for the 16th character is printed in columns 78, 79, and 80.

Subsequent printing observes the current setting for skip-over perforation, form length, and top-of-form position parameters.

If a fault occurs while printing a hex dump, the printer reverts to the normal fault state. When the fault is cleared, the printer resumes printing the hex dump (either a partial line with a form feed, or nothing at all). Top-of-form remains unaffected.

```
.The Impact Prin  09 54 68 65 20 49 6D 70 61 63 74 20 50 72 69 6E
ter Emulation pr  74 65 72 20 45 6D 75 6C 61 74 69 6F 6E 20 70 72
ints in one-up,.  69 6E 74 73 20 69 6E 20 6F 6E 65 2D 75 70 2C 0A
.two-up, and fou  09 74 77 6F 2D 75 70 2C 20 61 6E 64 20 66 6F 75
r up page window  72 20 75 70 20 70 61 67 65 20 77 69 6E 64 6F 77
s....             73 2E 0C 0D 0A
```

Figure 5. Sample Hex Dump

To begin a hex dump, first place the printer offline and enable the Hex Dump Mode option from the control panel. Next, place the printer online. Finally, send data to the printer from the host computer. Any data received from the host is “dumped” to the printout.

To cancel a hex dump, first place the printer offline. Then, disable the Hex Dump Mode option from the control panel. The paper may then be advanced to the next top-of-form.

PTX SETUP Option

The PTX SETUP Option menu selection has two submenu selections: Setup Parse and Setup SFCC. Only appears with IGP and LP+, not PCL5.

Setup Parse

Setup Parse allows you to enable or disable PTX SETUP processing. If Setup Parse is disabled, the printer prints PTX SETUP commands as regular text. The default setting is Disabled.

Setup SFCC

Setup SFCC sets the Special Function Control Code (SFCC) for the PTX SETUP functions. The default setting is decimal 33. (! Character)

Display Language

Display Language allows you to select the language used for control panel messages and configuration printouts. The available choices are English, German, French, Italian, Spanish, or Dutch. The default setting is English.

File System

Overwrite

Allows you to prevent files from being overwritten by disabling the overwrite function.

View File List

Displays the list of files in the file system. Pressing the DOWN key displays the file size.

Delete Files

Displays the list of all files in the file system. Pressing the ENTER key deletes the file displayed on the front panel.

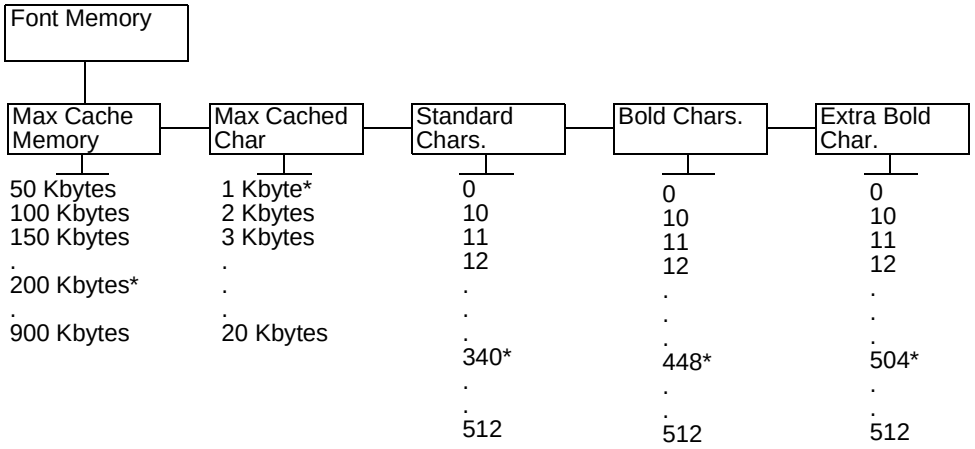
Optimize And Reboot

Reclaims flash space from deleted flash files. After pressing ENTER, wait for the printer to reboot.

Print File List

Prints a summary of the files stored in flash memory and several statistics on File System Usage.

Font Memory Menu (Not In PCL5 Emulation)



NOTE: For most applications, the default settings for font memory are acceptable. Therefore, do not change the defaults unless your application requires an uncommon font memory configuration.

Font Memory Menu

Activating Font Memory Options

After selecting any of the “Font Memory” options, perform the following steps to activate the new value:

1. Save your configuration changes. See the Config. Control menu option “Saving Configurations” on page 65.
2. Change the power-up configuration to match the configuration you just saved. See the Config. Control menu option “Power-up Configuration” on page 69.
3. Turn the printer power off and then on again.

Max Cache Memory

The Maximum Cache Memory option specifies the size of the memory block that can be allocated to the font cache. The font cache stores bitmaps that are created on demand from the font outlines stored in Flash memory. The cache allows the printer to print scalable fonts at optimum speed.

To calculate the memory requirement, use this equation:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{average character height (inches)} \times \text{average character width (inches)} \times \text{\# of characters to be cached}}{8}$$

The allowable range is 50 KBytes to 900 KBytes, in 50 KByte increments. The default value for this parameter is 900 KBytes.

Max Cached Char

The Maximum Cached Characters option specifies the size of the largest character that can be stored in the font cache. To calculate the memory requirement, use this equation:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{character height (inches)} \times \text{character width (inches)}}{8}$$

For example, if an application requires the use of a character that is 1 inch high by 1 inch wide, calculate the Maximum Cached Characters value as follows:

$$\frac{300 \times 300 \times 1 \times 1}{8} = 11{,}250$$

Therefore, select a value that is equal to or greater than 11,250. The closest available value is 12 KBytes.

The allowable range is 1 KBytes to 20 KBytes, in 1-KByte increments. The default value for this parameter is 1 KBytes.

Standard Chars

The Standard Chars option specifies the thickness or stroke weight of the text fonts. The allowable range is 0 to 512, in increments of 1. Default is 340.

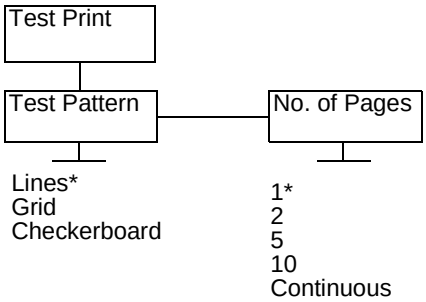
Bold Chars.

The Bold chars option specifies the thickness or stroke weight of the text fonts. The allowable range is 0 to 512, in increments of 1. Extra Bold Chars. Default is 448.

Extra Bold Char.

The Extra Bold Char option specifies the thickness or stroke weight of the text fonts. The allowable range is 0 to 512, in increments of 1. Default is 504.

Test Print Menu



The Test Print menu defines and activates a test printout. You must specify the test pattern and the number of pages to be printed.

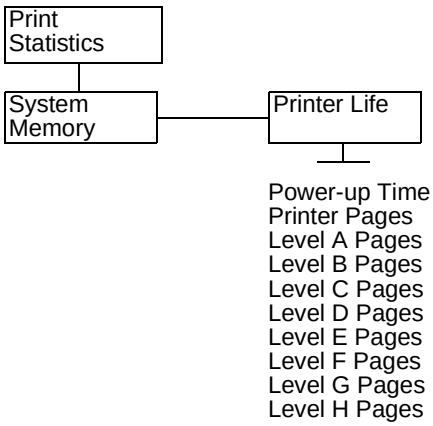
Test Pattern

The Test Pattern option selects the type of pattern to be used for the test printout. You may select a Lines test pattern, a Grid test pattern, or a Checkerboard test pattern. The Lines test pattern is the default. Selecting a test pattern will start the test.

Number of Pages

The Number of Pages option selects the number of pages for the test printout. You may select 1, 2, 5, 10, or a continuous printout. The default is 1 page.

Print Statistics Menu



The Print Statistics menu provides access to information about memory capacity and printer usage.

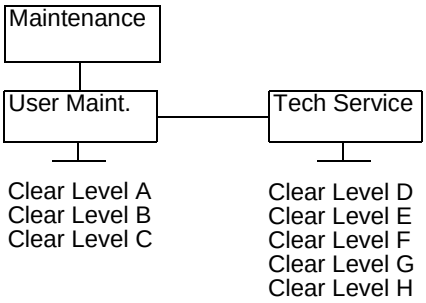
System Memory

The L5000 series printers have 32 MB of RAM (Random Access Memory), and 8 MB of Flash Memory. This is standard with all new printer shipments, and all upgraded printers. The 32 MB of RAM exceeds the amount previously specified for optimal speed for all currently available system configurations.

Printer Life

Printer Life displays the total number of hours that the printer has been powered up, the total number of pages that have been printed by the print engine, and the total number of pages that have been printed for each of the service levels. The displayed page count reflects A4-size paper (11.7 inches, normalized) and does not match the actual page count if other paper sizes are used.

Maintenance Menu



The Maintenance menu provides access to information about service levels for end-users and service technicians.

User Maint

The User Maintenance option resets the service level page count after you complete preventive maintenance (levels A, B, and C). See page 159 for more information.

Tech Service

The Technician Service option resets the service level page count after preventive maintenance is completed by a service technician (levels D, E, F, G, and H). See page 159 for more information.

Loading Flash Memory

Printer emulation and operating system software are loaded into flash memory at the factory, but you will install software or files in the following situations:

- The customer buys the PGL or VGL graphics, Expansion-CT, or IPDS option after the printer is installed
- The customer needs to upgrade printer software
- The customer needs different emulation software
- You have replaced the controller board
- You have added or replaced the flash memory card
- The customer needs to load logos, forms, TIFF files, setup files, and/or font files to the printer

Emulation software and fonts are supplied on one or more 3.5 inch, diskettes. Each emulation file is “executable,” which means you can expand it and copy it into the printer’s flash memory with a single command. The other kinds of files are not executable; however, before they can be downloaded, you might need to convert them into downloadable format. You can then copy them to the printer’s flash memory as binary data files, as instructed later in this section.

NOTE: The procedures that follow assume that you have some familiarity with DOS file commands.

The CNVT2FLS Utility Program

The CNVT2FLS program is a DOS utility that is supplied with the flash software on diskette. This utility converts logo, form, TIFF, setup, and font files into downloadable format.

To convert files into downloadable format, do the following:

1. Create a directory on the hard drive and copy the CNVT2FLS utility to that directory.
2. Copy all of the files to be converted to the directory where the CNVT2FLS utility resides.
3. Change to the drive and directory where the CNVT2FLS utility resides.
4. To display a brief help message, at the DOS prompt, enter the command name CNVT2FLS with no parameters:

   CNVT2FLS <Return>

   You will then see a help message similar to the following:

```
USAGE:

  CNVT2FLS file_name1 file_name2 file_name3 A <return>
  or
  CNVT2FLS file_name1 file_name2 file_name3 A FONT <return>
  file_name1: Input file name to be converted from.
  file_name2: Output file name for file download.
  file_name3: Flash file name to be stored in file system after download.
  hw_type: Specify A all the time.
  FONT: Optional, specify FONT if this is a font file.
```

- The first file name following the command name is the name of the input file that you want to convert.
- The second file name is the name of the downloadable output file, which the utility will create.
- The third file name is the name of the output file as it will be stored in the flash memory after downloading and later displayed on the printer LCD menus.
- The “A” parameter in the command line is a fixed parameter that must always be entered.
- If the file being converted is a font file, enter “FONT” following the “A” parameter on the command line. If the file is not a font file, omit “FONT.”

IMPORTANT **Be sure that you always enter the “A” parameter on the `CNVT2FLS` command line, as indicated above.**

When the *`CNVT2FLS`* utility runs, it reads the file named *`file_name1`* and creates the file named *`file_name2`*. The file named `file_name2` is a flash downloadable file that can be copied and downloaded to the printer, as detailed later in this section. The utility takes the filename you specify for *`file_name3`* and stores this information within the downloadable output file (*`file_name2`*). The *`file_name3`* file name is used only to determine the file name to display on the printer front panel menus.

IMPORTANT **Some earlier printers in this series had floppy disks drives for storing their emulation software. Newer printers use flash memory for emulation storage. To make disk-based and flash-based emulations compatible with one another, the first and third file names in the command line must be the same.**

5. To convert a font file, enter the following at the DOS prompt on the computer, for example:

```
CNVT2FLS custom.sf custom.dwn custom.sf A FONT <Return>
```

where *`custom.sf`* is the name of one of the font files you want to convert. This command converts the specified font file, creating the downloadable file *`custom.dwn`*.

6. Repeat step 5 for any additional font files to be converted.
7. To convert a setup file, enter the following at the DOS prompt, for example:

   `CNVT2FLS setup.ptx setup.dwn setup.ptx A <Return>`

   where *`setup.ptx`* is the name of one of the setup files you want to convert. This command converts the specified setup file, creating the downloadable file `setup.dwn`.
8. Repeat step 7 for any additional setup files to be converted.
9. To convert other kinds of files (a logo or form file, for example), enter the following at the DOS prompt, for example:

   `CNVT2FLS my_logo.xxx my_logo.dwn my_logo.lgo A <Return>`

   where *`my_logo.xxx`* is the name of one of the form or logo files you want to convert. This command converts the specified logo or form file, creating the downloadable file *`my_logo.dwn`*.
10. Repeat step 9 for any additional logo and form files to be converted.
11. Proceed to the next section to download the converted files.

IMPORTANT **Be sure that you always enter the "A" parameter on the `CNVT2FLS` command line, as indicated above.**

Downloading Into Flash Memory

CAUTION **When downloading an emulation to the printer, all other optional font files, customer-supplied logos, and setup files will be erased. You will then need to reload these files. Before starting a download procedure, be sure that you have all of the necessary installation files on hand.**

CAUTION **Do not interrupt the downloading process. Interrupting a download will damage the flash memory on the controller board and PrintNet card.**

To download emulation software, as well as downloadable files for logos, forms, TIFF, setup, and fonts to the printer, do the following:

1. If you plan to download any logo, form, TIFF, setup, or font files into the printer, you must first use the supplied CNVT2FLS DOS utility program to convert these files into downloadable format. See page 114. (Emulation files require no conversion.)
2. Take the printer offline by pressing the **ONLINE** key. Press the ONLINE + CLEAR keys simultaneously to unlock the **ENTER** key.
3. Make a printout of *all* saved configurations. (Installing new software erases all saved configurations. You will use the printouts later to restore the printer configuration.)

NOTE: Loading flash memory does not affect the page count or other data stored in NVRAM.

4. Set the printer power switch to O (off).
5. If the printer is already connected to the parallel port of an IBM-compatible computer that is using the PC-DOS™ or MS-DOS® operating system, skip to step 11. If not, continue with step 6.
6. Unplug the printer AC power plug from its electrical outlet.
7. Disconnect all data input cables from the printer interface.
8. Connect a parallel data cable to the default parallel port (LPT1) of an IBM-compatible computer that is using the PC-DOS or MS-DOS operating system.

NOTE: You can connect the cable to the LPT2 port if the LPT1 port is already in use. If you use the LPT2 port, the download command is different, as described in the note after step 33.

9. Connect the parallel data cable to the parallel port of the printer.
10. Plug the printer AC power plug into its electrical outlet.
11. Power on the computer.
12. Set the printer power switch to | (on).
13. If you have no emulation software to install and you are installing only logo, form, TIFF, setup, or font files, skip to step 37. If you do have emulation software to install, continue with step 14.
14. Set the printer power switch to O (off).
15. If the emulation you are installing is supplied on a single diskette, skip to step 28. If the emulation is supplied on one or more diskettes, you must first recombine the multiple files from the diskettes into one file on your computer's hard drive; continue with step 16.
16. Create a directory on your computer hard drive where you will store the recombined files from the emulation diskettes by typing the following at the DOS prompt:

    MD DOWNLOAD <Return>

17. Make the newly-created directory the "active" directory by typing the following at the DOS prompt:

    CD DOWNLOAD <Return>

18. Insert the *last* emulation diskette in the series (e.g., 2 of 2, 3 of 3, etc.) into diskette drive A (or B) of the computer.

19. Get the name of the compressed emulation file on the diskette by typing the following at the DOS prompt:

    `DIR A: <Return>`

    (If the diskette is in drive B, type **`B: <Return>`**)

    The file name of the compressed file on the diskette takes the form *`part_num`*`.zip,` for example 123456.zip.

20. At the DOS prompt type:

    `A:\PKUNZIP A:\`*`part_num`*

    where ***`part_num`*** is the six digit number you noted in the previous step.

    (Replace **`A:`** with **`B:`** if you are using the B drive.)

21. The PKUNZIP® program will execute, and the following message will appear on the computer screen:

    Insert disk #1 - Press a key when ready

22. Remove the diskette in the disk drive and insert the diskette labeled

    Disk 1 of 2 (or 1 of 3, etc.)

23. Press the <Return> key on the computer. After the file is expanded to the hard drive, the following message will appear on the computer screen:

    Insert disk #2 - Press a key when ready

24. Remove the diskette in the disk drive and insert the diskette labeled

    Disk 2 of 2 (or 2 of 3, etc.)

25. Press the <Return> key on the computer. If there are only two diskettes for the emulation, you will be returned to the DOS prompt when the expansion is complete. If there are more than two diskettes, you will be asked to insert disk #3 and press a key. Continue in this manner until you have inserted all of the emulation diskettes and the DOS prompt has returned.
26. Type the following at the DOS prompt:

    DIR <Return>

    You will see a directory listing containing the file ***part_num*.exe,** where the filename is the six digit number (e.g., 123456.zip) you noted above. Write down the complete name of the file with the `.exe` extension. **This is the file you will download into the printer.**
27. Skip to step 31.
28. Insert the emulation diskette into diskette drive A (or B) of the computer.
29. Make the diskette drive the active drive by typing the following at the DOS prompt:

    A: <Return>

    (If the diskette is in drive B, type **B: <Return>**)
30. Get the name of the emulation file on the diskette by listing the contents of the diskette; at the DOS prompt type:

    DIR <Return>

    The file name of the emulation file on the diskette takes the form ***part_num*.exe,** for example 123456.exe.
    Write down the complete name of the file with the `.exe` extension. **This is the file you will download into the printer.**
31. On the printer control panel, press and hold down the **ONLINE+CLEAR** keys. Without releasing the keys, power the printer on. Continue holding the **ONLINE** and **CLEAR** keys down.

32. When you see “WAITING FOR FILE DOWNLOAD” on the LCD, release the **ONLINE** and **CLEAR** keys.
33. At the DOS prompt on the computer type, for example:

    `123456.exe -pb <Return>`

    where `123456.exe` is the emulation file you noted in step 26 (for an emulation on multiple diskettes) or in step 30 (for an emulation on a single diskette). This command expands the emulation file, then copies it as a binary file into the flash memory in the printer.

NOTE: If you are downloading the file using the LPT2 port on the computer, enter the following DOS command, for example:

`123456.exe -pb2 <Return>`

34. While the file is being copied into memory, the printer LCD informs you of the load process and status. (Messages are listed in the table on page 228.)
35. Wait until the new program has successfully loaded into printer memory.
36. If you have any additional software to install (logo, form, TIFF, setup, or font files), continue with step 37. If you have no additional software to install, skip to step 48.
37. Set the printer power switch to O (off).
38. On the printer control panel, press and hold down the **ONLINE+CLEAR** keys. Without releasing the keys, power the printer on. Continue holding the **ONLINE** and **CLEAR** keys down.
39. When you see “WAITING FOR FILE DOWNLOAD” on the LCD, release the **ONLINE** and **CLEAR** keys.
40. If the software to be installed is already on the hard drive, change to the drive and directory where the software resides, then skip to step 43. If the software to be installed is on diskette, continue with step 41.
41. Insert the diskette containing the software to be installed into diskette drive A (or B) of the computer.

42. Make the diskette drive the active drive by typing the following at the DOS prompt:

    A: <Return>

    (If the diskette is in drive B, type **B: <Return>**)

43. Get the names of all of the logo, form, TIFF, setup, and font files that you want to download by listing the contents of the directory; at the DOS prompt type:

    DIR <Return>

    The downloadable files in the directory take the form *file_name*.dwn
    Write down the complete name of each file with the .dwn extension.

44. Download the files to the printer by using the DOS copy command. Enter the following at the DOS prompt, for example:

    copy /b file_name1.dwn+file_name2.dwn+... LPT1 <Return>

NOTE: The above command example assumes that LPT1 is used as the download port from the computer, and that the printer is already in download mode, waiting for file download, before you copy the files to the printer. If you are downloading the files using the LPT2 port on the computer, substitute “LPT2” for “LPT1” in the above commands.

45. While the files are being copied into memory, the printer LCD informs you of the load process and status. (Messages are listed in the table on page 228.)
46. Wait until the new files have successfully loaded into printer memory.
47. If you have any more software to install (logo, form, TIFF, setup, or font files), go back to step 37.
48. When all of the new software has successfully loaded into memory and the printer has reset itself, set the printer power switch to O (off).

49. Remove the diskette(s) from the computer and store them with the printer.
50. If you had to install a parallel data cable to the computer and printer in step 8, continue with step 51. If not, skip to step 56.
51. Unplug the printer AC power plug from its electrical outlet.
52. Power off the computer.
53. Disconnect the parallel data cable from the computer and from the printer.
54. Reconnect the customer's data input cable(s) to the printer, if required.
55. Plug the printer AC power plug into its electrical outlet.
56. Set the printer power switch to | (on). If the printer is on line, press the ONLINE key to place the printer offline. Press the ▲ + ▼ keys simultaneously to unlock the **ENTER** key.
57. Using the configuration printout you made in step 3, restore the printer configuration(s).
58. Press the ▲ + ▼ keys simultaneously to lock the **ENTER** key.
59. Press the **ONLINE** key to place the printer on line.

Flash Messages

Table 2. Flash Messages

LCD Messages	Explanation	Required Action
CLEARING PROGRAM FROM FLASH	The program successfully loaded into printer RAM and the checksum matched. The printer is now deleting the old program from the flash file system.	None.
DIAGNOSTICS PASSED	The printer self-test has finished, and there were no errors.	None.

Table 2. Flash Messages

ERROR OCCURRED FLUSHING QUEUES *	An interim message that displays while the printer discards host data it cannot use because a fault condition exists. While this message displays, the asterisk (*) rotates.	Wait. When the asterisk (*) stops rotating, a different fault message will appear: troubleshoot the final message.
ERROR: DC PROGRAM NOT VALID	There is no emulation software installed in the DC flash memory, or the emulation software in the DC flash memory is corrupted.	Power off the printer and download the program again. If the message persists, contact service provider.
ERROR: DRAM AT ADDRESS *xxxxxxxx*	The printer found a defective DC DRAM memory location.	Contact service provider.
ERROR: FLASH TYPE IS NOT SUPPORTED	This type of flash memory SIMM is unsupported, or the file system in the DC flash memory is corrupted.	Power off the printer and download the program again. If the message persists, contact service provider.
ERROR: FLASH DID NOT PROGRAM	The printer encountered an error while trying to program the DC flash memory.	Power off the printer and download the program again. If the message persists, contact service provider.
ERROR: FLASH NOT DETECTED	The printer could not find any DC flash memory.	Contact service provider.
ERROR: NO DRAM DETECTED	The printer could not find any DC DRAM.	Contact service provider.
ERROR: NVRAM FAILURE	The non-volatile memory has failed.	Contact service provider. (Do NOT attempt to replace NVRAM.)

Table 2. Flash Messages

ERROR: PROGRAM NEEDS MORE DRAM	The printer requires more DC DRAM memory in order to run the downloaded program, or in order to use the downloaded files.	Use a smaller emulation program or have your service provider add DC DRAM to the controller board.
ERROR: PROGRAM NEEDS MORE FLASH	The printer requires more DC flash memory in order to run the downloaded program, or in order to use the downloaded files.	Optimize the flash file system. (See page 107.) If the message persists, use a smaller emulation program, or have your service provider add DC flash memory to the controller board.
ERROR: PROGRAM NOT COMPATIBLE	The downloaded program is not compatible with the printer.	Use the correct emulation software option(s) for this printer model.
ERROR: PROGRAM NOT VALID	The printer did not detect an emulation program in DC flash memory, or the emulation program in DC flash memory is present but corrupted.	Power off the printer and download the program. If the message persists, contact service provider.
ERROR: SECURITY PAL NOT DETECTED	The security PAL is not present or has failed.	Contact service provider
ERROR: SHORT AT ADDRESS *xxxx*	Hardware failure in DC DRAM or in controller board circuitry.	Contact service provider.
ERROR: WRITING TO FLASH	Hardware or software fault in DC flash memory.	Power off the printer and download the program again. If the message persists, contact service provider.

Table 2. Flash Messages

ERROR: WRONG CHECKSUM	The printer received the complete program or data file, but the checksum did not match. The data were corrupted during download.	Power off the printer and download the program again.
FILE EXISTS ENABLE OVERWRITE	The “Overwrite Files” menu selection is set to Disable, and you attempted to write to an existing file in the flash file system.	Enable the “Overwrite Files” menu selection. Then, try the operation again.
FILE SYS FULL ADD FLASH	The file to be stored in the flash file system is too big for the flash, even if you were to delete files from the file system and optimize the file system.	Have your service provider add more DC flash memory to the controller board, then optimize the flash file system (refer to page 107). Finally, try the operation again.
FILE SYS FULL DELETE FILES	The file to be stored in the flash file system would either: 1. exceed the available free space in the file system; or 2. exceed the maximum number of files (144) that the file system can hold.	Delete one or more files from the flash file system. Then, optimize the flash file system (refer to page 107). Finally, try the operation again.
FILE SYS FULL OPTIMIZE&REBOOT	There is insufficient free space in the flash file system to do the requested operation, and there are existing file(s) in the flash file system that have been marked for deletion.	Optimize the flash file system to delete the marked files, freeing the space they were occupying (refer to page 107). Then, try the operation again.

Table 2. Flash Messages

FILE SYS INVALID OPTIMIZE&REBOOT	The flash file system is either invalid (corrupt) or not present. The cause can be either a program error or a hardware failure of the DC flash memory.	Reboot the printer several times. If the message persists, replace the DC flash memory on the controller board, or see service provider.
FILE SYS WRITE CHECK FLASH	One or more errors occurred while the printer was writing a file into the flash file system. The printer has marked the corrupt file for deletion. The cause can be data that became corrupted during download, or a hardware failure of the DC flash memory. **NOTE:** Although the corrupt file cannot be used, it still occupies space in the flash file system. To free this space, optimize the flash file system. (Refer to page 107.)	Optimize the flash file system to delete any marked files (refer to page 107), then retry the operation. (If you were downloading software, optimize the flash file system, then power off the printer and download the software again.) If the message persists after several tries, contact service provider.
INSUFFICIENT RAM REBOOT/ADD RAM	Before the printer can write a file into the flash file system, the file must be completely stored in the DC DRAM. In certain situations, there might be insufficient DRAM space for the file, especially when the printer has been operating for some time.	Reboot the printer to clear the DC DRAM. If the message persists, contact service provider.
LOADING FONTS	The printer is copying fonts from DC flash memory to DC DRAM.	None.

Table 2. Flash Messages

LOADING PROGRAM FROM PORT *xx*%	The printer is downloading the new program into printer RAM. *xx* indicates how much of the program has been downloaded.	None.
LOADING PROGRAM INTO FLASH	The printer has deleted the old program from the flash file system, and is now writing the new program into the flash file system.	None.
OPTIMIZING FLASH FILES	The printer is reclaiming unused space from deleted files in the flash file system.	None (wait for the printer to reboot).
RESETTING... PLEASE WAIT	The printer has finished writing the new program into the flash file system and is automatically resetting itself.	None.
SECURITY CODE VIOLATION	The software running or being downloaded does not match the security PAL code.	Contact service provider.
STANDBY...	The printer is performing internal initializations.	None.
TESTING HARDWARE PLEASE WAIT	The printer is running its hardware self-test.	None.
WAITING FOR PROGRAM DOWNLOAD	The printer is ready to receive the download data.	Start sending the file to the printer.

4 *Consumables Replacement*

Consumables Replacement

For the best print quality, the printer consumables should be replaced at the intervals specified in the following table. The yield of the supplies is based on a 4% coverage of letter size (8.5 inch x 11 inch) paper, but your yield may vary depending on your print applications, environmental conditions, and toner density setting.

Replacement Intervals

Consumable Item	Part Number	Replacement Interval (in Pages)[1]
Toner Cartridge	703532-001	21,000
Waste Toner Bottle	703539-001	150,000
Photoreceptor Drum	703535-001	150 - 300,000 See Note 2
Developer	703548-001	150,000
Developing Unit	705739-001	600,000

Note 1: Will vary with paper size, media type, and toner coverage.
Note 2: Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g. labels, card stock, plastic, or vinyl) may reduce drum life by as much as 50%.

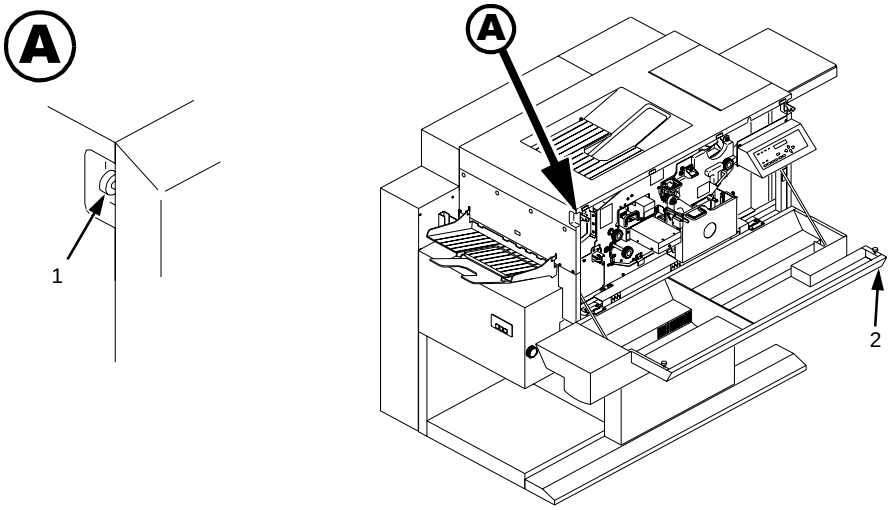
Replacing The Toner Cartridge

NOTE: When replacing the toner cartridge, put the old cartridge on a disposable wrapper (e.g., paper towels, newspaper) to minimize toner spillage.

Vinyl gloves may be worn to prevent toner from contacting the skin. If necessary, use only cold water to remove toner from skin or clothing.

Opening The Front Cover

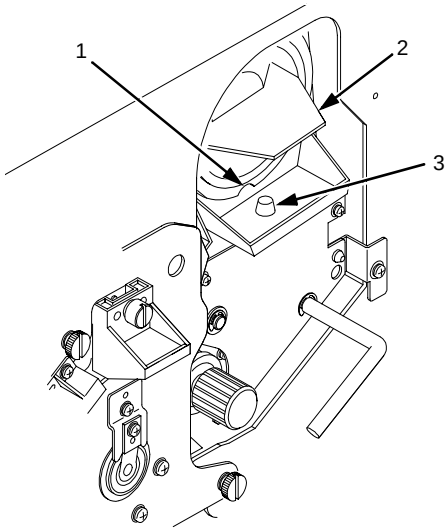
1. Take the printer offline.
2. When paper motion stops, wait 15 seconds, then open the printer front upper cover.



Legend:

1) Open/Close Button
2) Front Cover

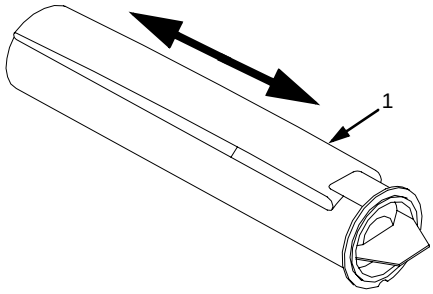
3. Rotate the old toner cartridge counterclockwise until the notch is aligned with the pin in the toner hopper, and remove the cartridge.



Legend:

1) Notch
2) Toner Cartridge
3) Positioning Pin

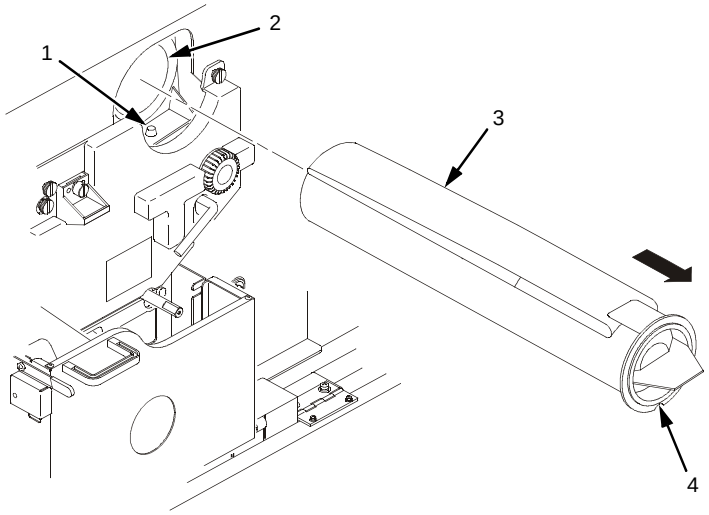
4. Put the old cartridge into a plastic bag and discard it.
5. Keep the new toner cartridge in its package. Holding it level, shake it back and forth several times as shown by the arrows. This loosens the toner in the cartridge.



Legend:

1) Toner Cartridge

6. Remove the new toner cartridge from its package.
7. With the cover tape facing up, begin inserting the cartridge into the toner hopper, and slowly pull off the cover tape in the direction of the arrow. Remove the last of the tape just as the cartridge is completely inside the hopper.

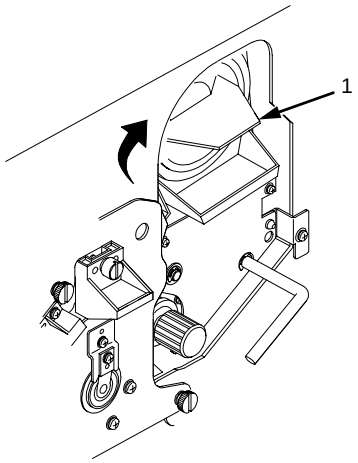


Legend:

1) Pin
2) Toner Hopper
3) Cover Tape
4) Notch

8. Fit the notch to the pin on the developing unit. Push the new toner cartridge as far as possible into the toner hopper.

9. Rotate the cartridge clockwise until it stops.



Legend:

1) Toner Cartridge

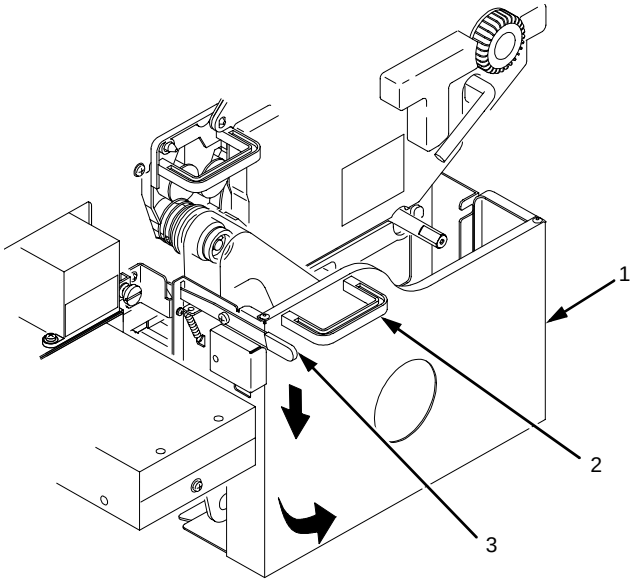
10. If any toner has spilled, remove it with wet tissue paper or a toner vacuum.
11. Close the front upper cover.

Replacing The Waste Toner Bottle

When the “WASTE TONER FULL” message appears on the control panel, replace the waste toner bottle by performing the following steps, and discard the full bottle. Do not reuse the bottle.

To replace the waste toner bottle, perform the following steps:

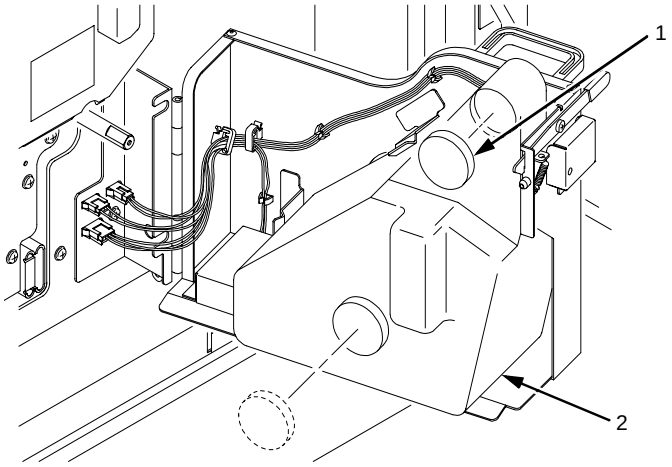
1. When paper motion stops, wait 15 seconds, then open the printer front upper cover. (See page 130.)
2. Lower the opening lever, pull the green handle toward you, and open the waste toner recovery unit.



Legend:

1) Waste Toner Recovery Unit
2) Green Handle
3) Opening Lever

3. Remove the cap from the outside of the waste toner bottle, and cap the toner bottle.



Legend:

1) Cap
2) Waste Toner Bottle

4. Remove the waste toner bottle from the unit and discard it.
5. Install a new waste toner bottle.
6. Close the printer front cover.
7. Clear Error 28, “WASTE TONER FULL,” as follows:
   a. Press CLEAR.
   b. Press UP and DOWN to unlock the configuration menu.
   c. Enter the configuration menu and select the Paper Control menu.
   d. Select the “Reset Toner Full” option and press ENTER.
   e. Exit the configuration menu.
   f. Press ONLINE.

Replacing The Photoreceptor Drum

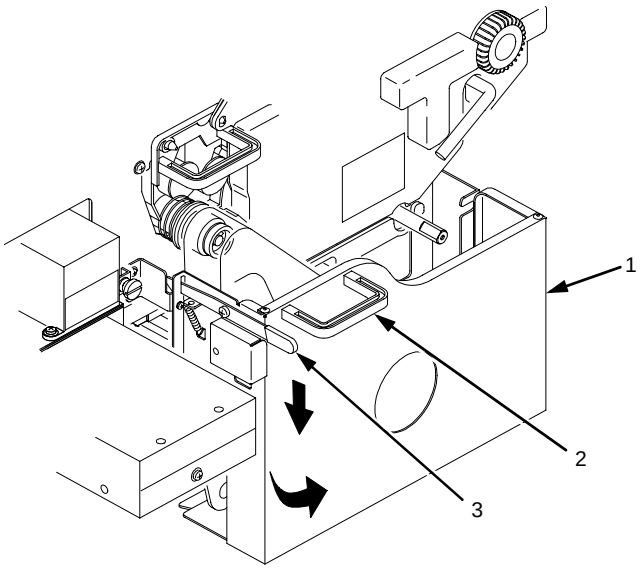
Drum life depends on media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) can reduce drum life as much as 50%.

To replace the drum, you need a drum auxiliary rod and a flat-tip screwdriver. Please read all steps before beginning the replacement procedure.

CAUTION **Do not do this procedure unless you have received the appropriate training. Do not do this procedure without the drum auxiliary rod (P/N 703531-170), as you may damage the drum.**

1. Turn the power switch OFF.
2. Open the printer front upper cover.

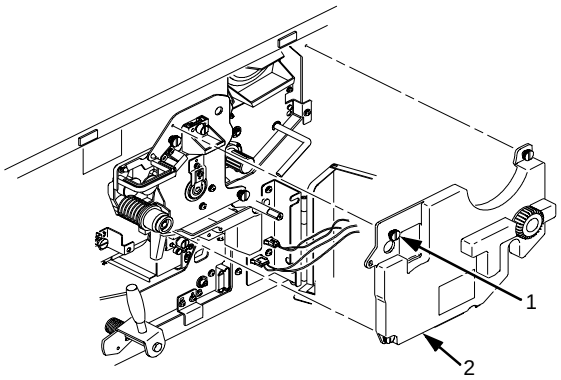
3. Open the waste toner recovery unit by pushing downward on the lever. Pull the green handle and swing the unit outward away from the printer.



Legend:

1) Waste Toner Recovery Unit
2) Green Handle
3) Opening Lever

4. Loosen the three thumbscrews on the upper inner cover. Then remove the cover.

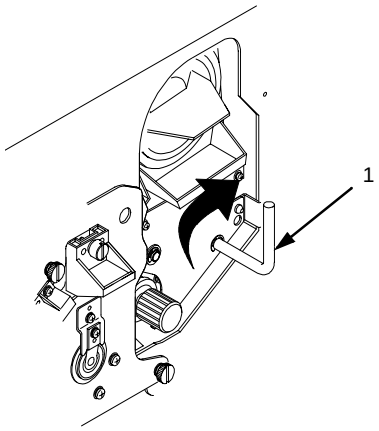


Legend:

1) Thumbscrews (3)
2) Upper Inner Cover

CAUTION **Failure to do the next step will damage the photoreceptor drum.**

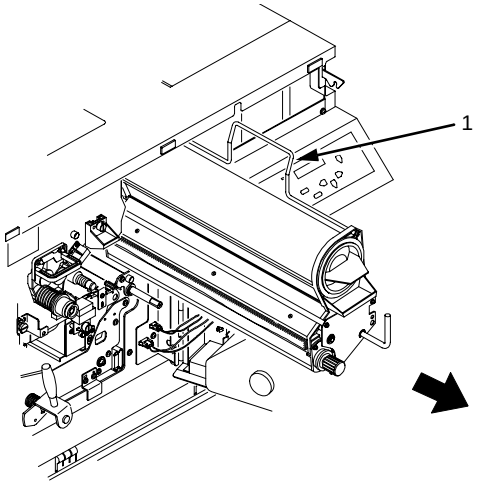
5. Rotate the developing unit lever fully clockwise so that it is pointing straight up (to separate the developing unit from the photoreceptor drum).



Legend:

1) Lever

6. Remove the developing unit by holding the lever in one hand and pulling the developing unit partially out of the printer.



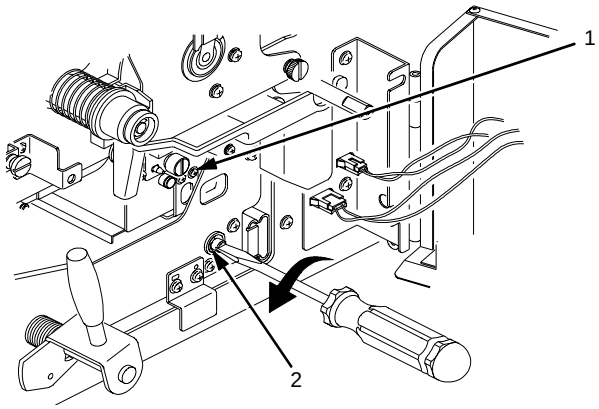
Legend:

1) Hanger

7. With the other hand, grasp the hanger and remove the developing unit from the printer.
8. Vacuum any spilled toner.

CAUTION **The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 9 and 10 will damage the drum.**

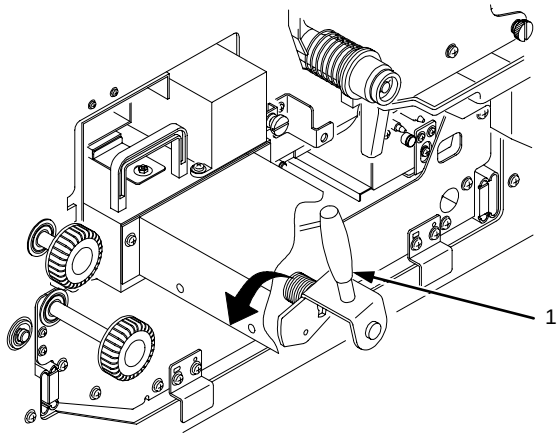
9. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
   a. If the charger starts to move up, it is already in the down position.
   b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the complete down position.



Legend:

1) Transfer Charger
2) Transfer Elevator Drive Shaft

10. Lower the transport unit by turning the green lever on the transport unit to the left.

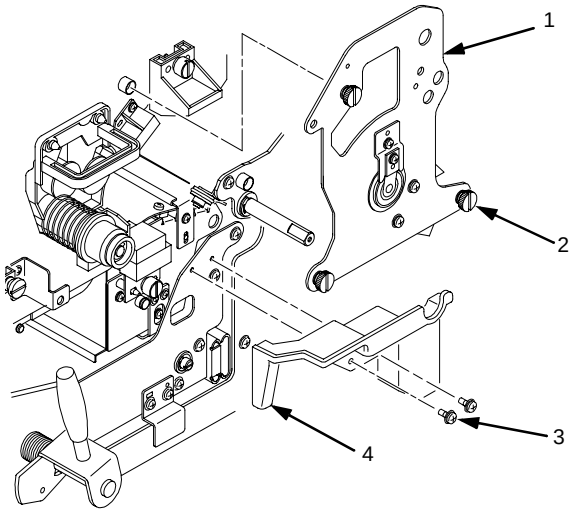


Legend:

1) Green Lever

11. Loosen the three thumbscrews securing the drum plate and remove the drum plate.

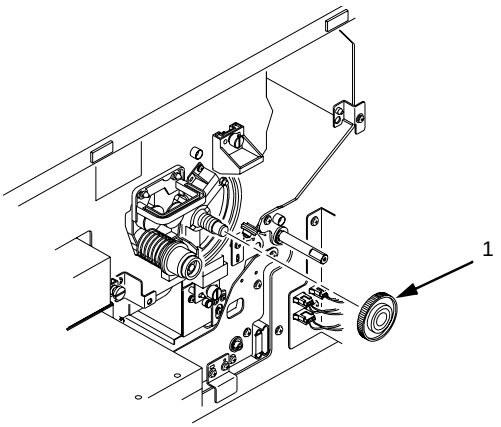
12. Remove the two screws on the lower inner cover. Then remove the cover.



Legend:

1) Drum Plate
2) Thumbscrews (3)
3) Screws (2)
4) Lower Inner Cover

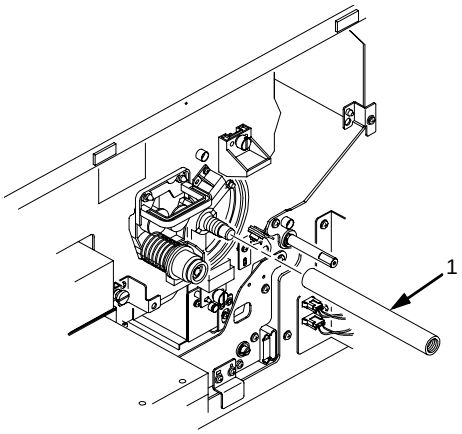
13. Remove the nut from the end of the drum shaft.



Legend:

1) Nut

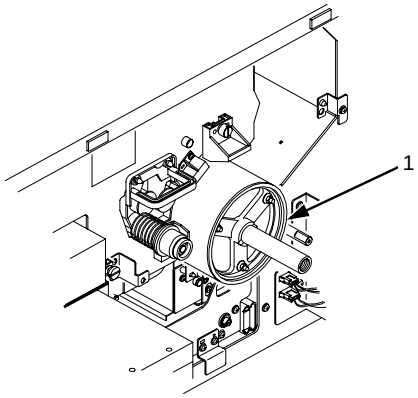
14. Screw the drum auxiliary rod onto the drum shaft.



Legend:

1) Drum Auxiliary Rod

15. Carefully pull the old drum outward along the drum auxiliary rod. Hold the front and back sides when the drum is nearly out of the printer, and remove it with both hands.



Legend:

1) Drum

16. Pack the old drum for shipment using the original packaging material, and close the cover of the box.

17. Wipe the drum shaft clean with a cloth.

CAUTION **Avoid touching the surface of the drum with your hands, which reduces the life of the drum.**

Exposing the drum to light shortens its life. Do not expose the drum to direct sunlight, and install it within five minutes under typical room lighting conditions. When removing the drum from its packaging, do not touch the surface of the drum, because fingerprints and scratches can damage the surface and cause poor print quality.

18. Remove the new photoreceptor drum from its package. Do not discard the packaging material, as it will be needed for future drum disposal.

NOTE: Note that the ends of the drum are identical; there are no front or back ends.

19. Wipe inside the endcaps of the drum with a cloth to ensure that they are clean.

20. Using both hands, carefully slide the drum onto the drum auxiliary rod. When the drum reaches the area where the auxiliary rod connects to the drum shaft, lift the drum very slightly over the connection. Then let the drum rest on the rubber rollers as you gently guide it into the printer.

CAUTION **The drum must rest on the rubber rollers to avoid being scratched.**

21. When the drum is fully inserted into the printer, the end of the drum will be slightly recessed relative to the front of the printer. At this point, the rubber guide rollers should be visible. Slightly lift the drum up off of the rubber rollers and rotate the drum by hand while applying inward pressure, until the drum moves slightly farther into the printer and locks in place.

CAUTION **In order to position the drum slot and the drum shaft pin, push the drum in all the way to the back and rotate it until you feel it drop in place. Failure to lock the drum in place properly may cause severe damage to the printer.**

Never force the drum onto the shaft. If it feels as though the drum is not seating properly, remove the drum and inspect the shaft for any foreign material or burrs.

22. Remove the drum auxiliary rod from the drum shaft.
23. Install the nut and tighten it securely by hand on the drum shaft.
24. Install the lower inner cover and secure it with the two screws removed earlier.
25. Install the drum plate and tighten the thumbscrews. While installing the drum plate, place your thumb over the copper grounding clip and hold it in place. Otherwise the grounding clip can be bent, making no contact with the drum shaft.
26. After installing the drum plate, visually verify good electrical contact between the copper grounding clip and the end of the drum shaft.

    Alternatively, measure the resistance. Connect one lead of an ohmmeter to the bracket on the drum plate, and touch the other lead to the edge of the drum. Normal resistance should be 0 Ω.
27. Install the developing unit.
28. Raise the transport unit by turning the green lever on the transport unit to the right.
29. Install the upper inner cover and tighten the thumbscrews.
30. Close the waste toner recovery unit and ensure that it latches.
31. Close the printer front cover.

Proper Disposal Of A Drum Unit

Federal regulations prohibit inappropriate disposal of laser print drums. Dispose of used drums by shipping them to one of the following organizations:

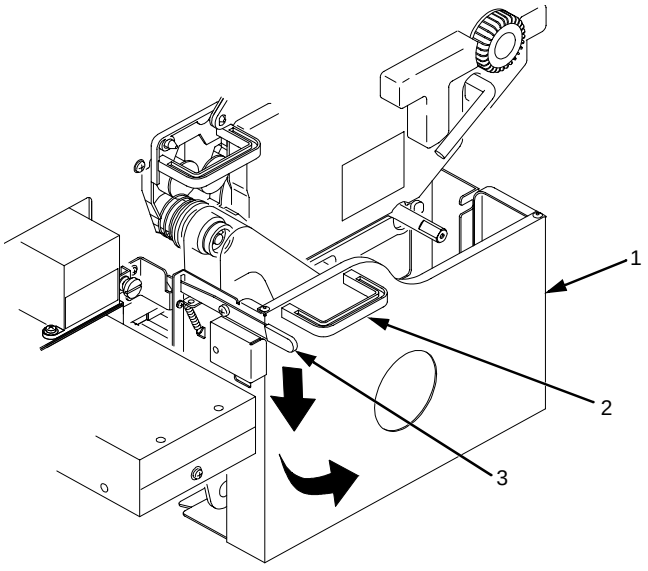
Within U.S.A.
U.S. Fuji Electric Inc.
240 Circle Drive N.
Piscataway, NJ 08854
Attn: Rod Storm
Phone: (732) 560-9410

Outside U.S.A.
Fuji Distribution Europe B.V.
Attn: Mr. Asada
Leisteen 7,2132 ME
Hoofddorp,
The Netherlands.
TEL: 20-6534790

Removing The Developing Unit

CAUTION **Do not do this procedure unless you have received the appropriate training. Do not damage the sensors while cleaning the developing unit. (If damage occurs, contact your service representative.)**

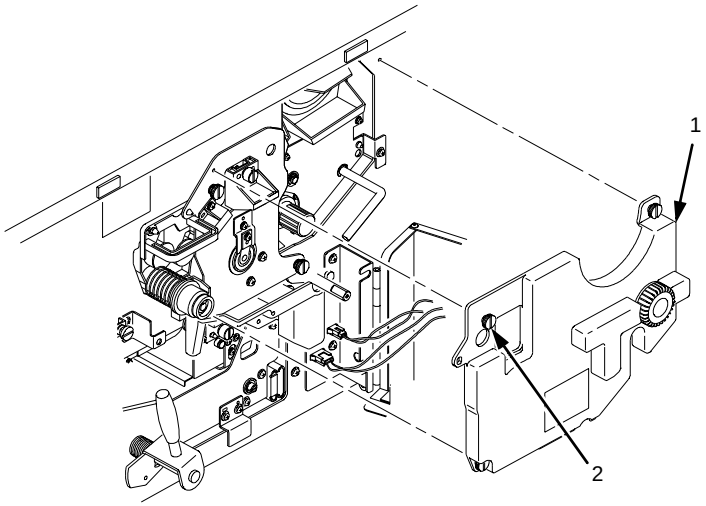
1. Turn the power switch OFF.
2. Open the printer front upper cover.
3. Open the waste toner recovery unit by pushing downward on the opening lever. Pull the green handle and swing the unit outward away from the printer.



Legend:

1) Waste Toner Recovery Unit
2) Green Handle
3) Opening Lever

4. Remove the three thumbscrews and the upper inner cover.

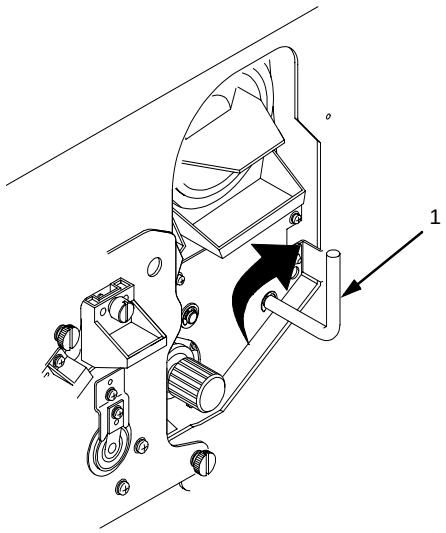


Legend:

1) Upper Inner Cover
2) Thumbscrews (3)

CAUTION **Failure to do the next step will damage the photoreceptor drum.**

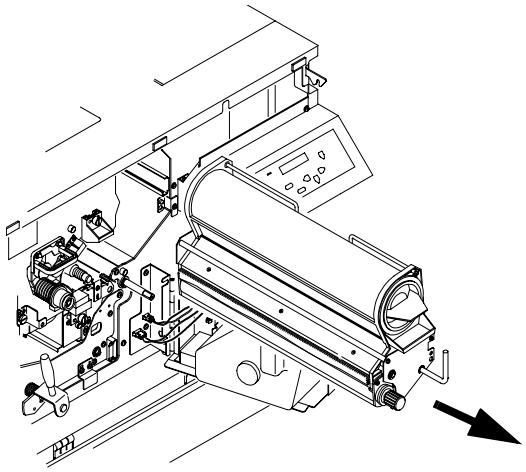
5. Rotate the developing unit lever fully clockwise so that it is pointing straight up (to separate the developing unit from the photoreceptor drum).



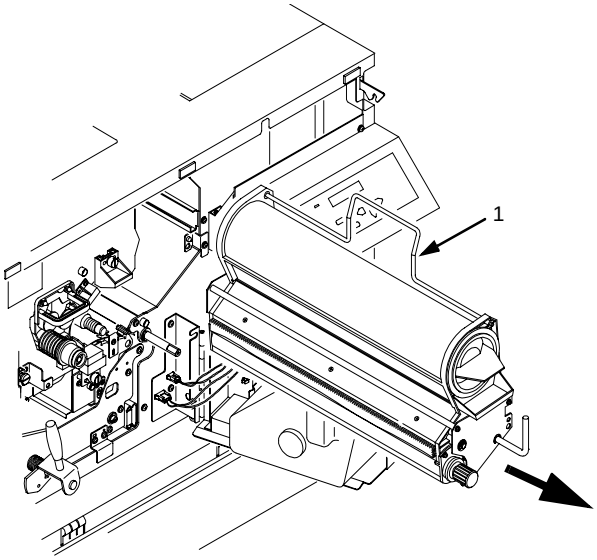
Legend:

1) Lever

6. Remove the developing unit by holding the lever in one hand and pulling the developing unit partially out of the printer.



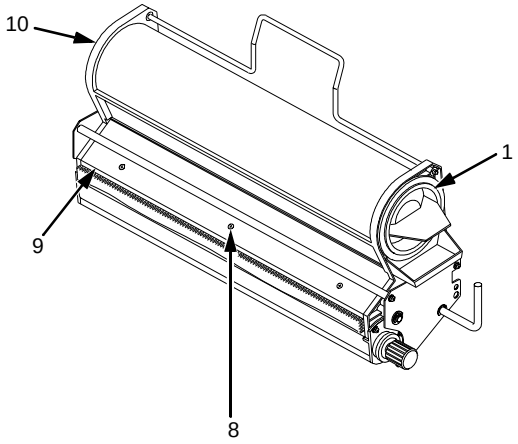
7. With your other hand, grasp the hanger and remove the developing unit from the printer.



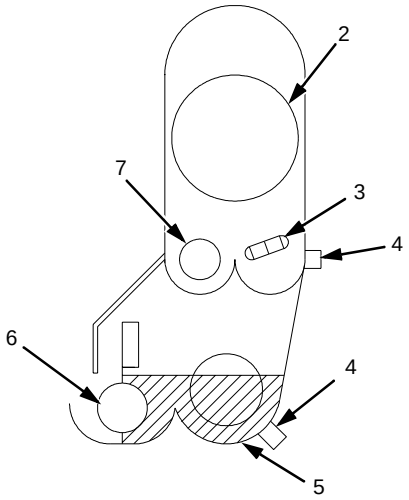
Legend:

1) Hanger

Replacing Or Adding The Developer



Cross Section of
Developing Unit



Legend:

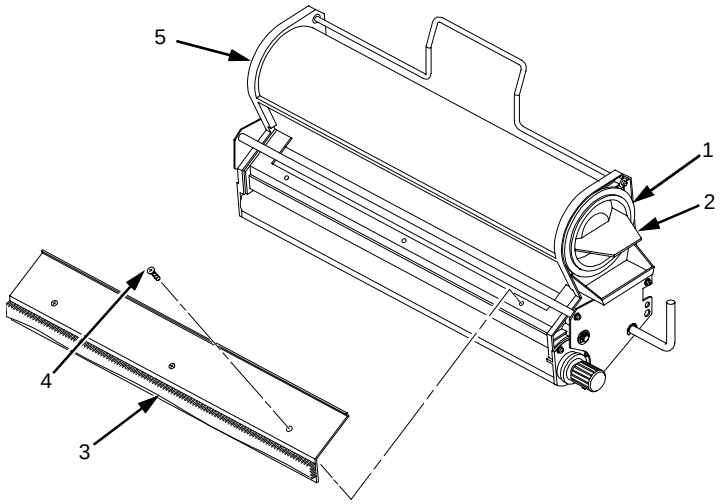
1) Toner Cartridge
2) Toner Hopper
3) Auger
4) Toner Sensor
5) Developing Tank
6) Developing Roller
7) Toner Supply Roller
8) Screws (3)
9) Cover
10) Developing Unit

1. Prepare a plastic bag in which the developing unit can be placed and place the developing unit in the plastic bag.
2. Remove the developing unit from the printer. (See figure below.)
3. If you are replacing the developing unit, dispose of the old unit properly, and go to step 10. If you are just replacing the developer, continue with step 4.

IMPORTANT **When replacing developer in an existing developing unit, you must empty and clean the unit before adding new developer (every 150,000 pages).**

CAUTION **Do not do this procedure unless you have received the appropriate training. Do not damage the sensors while cleaning the developing unit. (If damage occurs, contact your service representative.)**

4. Turn the toner cartridge knob counterclockwise until it stops, then remove the cartridge from the developing unit.



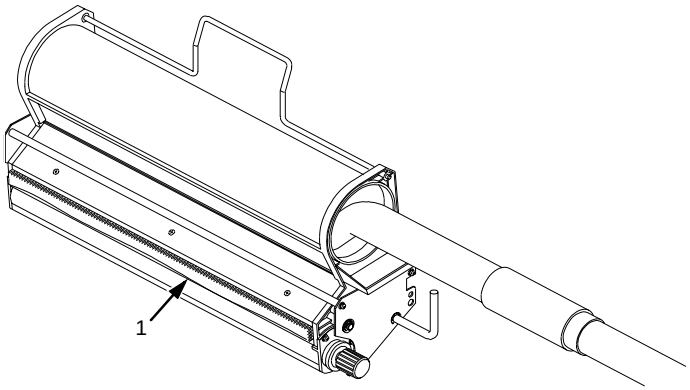
Legend:

1) Toner Cartridge
2) Toner Cartridge Knob
3) Cover
4) Screws (3)
5) Developing Unit

5. Remove the three screws on the developing unit cover and remove the cover.

CAUTION **The toner sensor is sensitive to both electrostatic discharge (ESD) and positional adjustment. Do not touch the sensor with your hand or jar it from its factory-set position.**

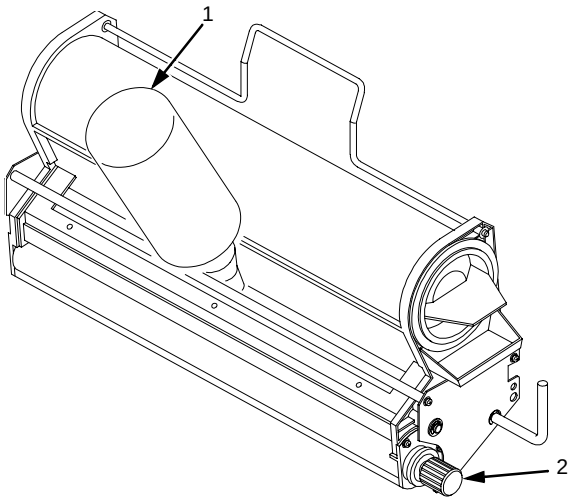
6. With the developing unit held in the plastic bag, do the following:
   a. Remove the developer and toner in the toner hopper by gently shaking the developing unit up and down with the opening of the toner cartridge facing downward.
   b. Rotate the developing unit and gently shake it, to allow any remaining developer or toner to fall out of the cover slot.
7. Remove the developing unit from the plastic bag and place it on a protected surface.
8. Remove any developer and toner which remains on the toner supply roller and the auger by vacuuming the entrance of the toner hopper using a toner vacuum cleaner equipped with a narrow nozzle.



Legend:

1) Toner Spray-Guard Brush

9. Vacuum the toner from the toner spray-guard brush on the developing unit.
10. Shake the new developer bottle several times, remove the bottle cap, and screw the nozzle tightly onto the bottle.
11. While rotating the developing roller knob counterclockwise, evenly pour the entire bottle of developer powder into the developing unit.



Legend:

1) Developer Bottle
2) Developing Roller Knob

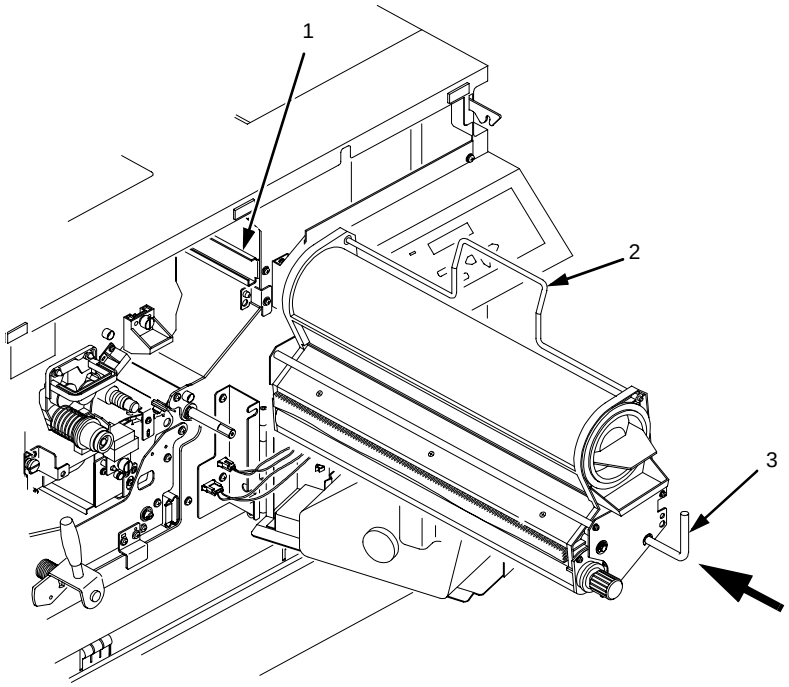
12. Replace the cover and tighten the screws.

IMPORTANT **If toner or developer spills on clothing, use cold water to remove it.**

Installing The Developing Unit

CAUTION **Failure to perform the next step will damage the photoreceptor drum.**

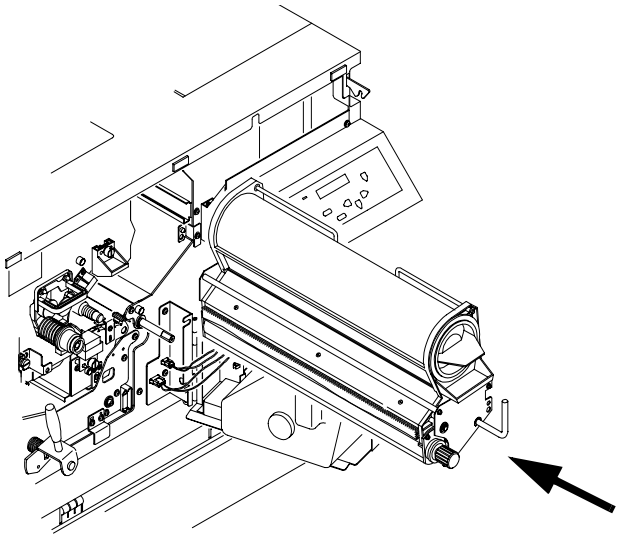
1. On the developing unit, rotate the lever fully clockwise so that it is pointing straight up.
2. Holding the lever in one hand and the hanger in the other hand, insert the developing unit on the guide rail.



Legend:

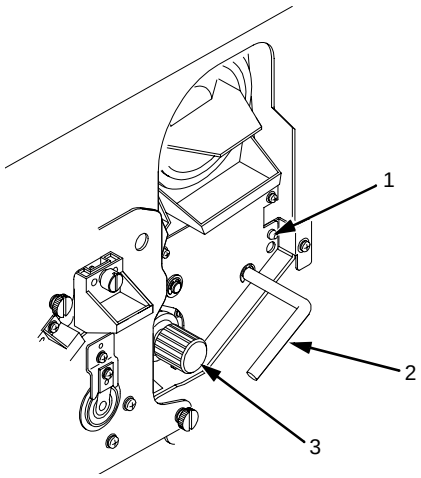
1) Guide Rail
2) Hanger
3) Lever

3. Rotate the hanger to the right so that it rests against the developing unit, and push the developing unit in.



4. Rotate the developing roller knob counterclockwise until the unit drops into its final resting position. The positioning pin should protrude through the main body of the developing unit.

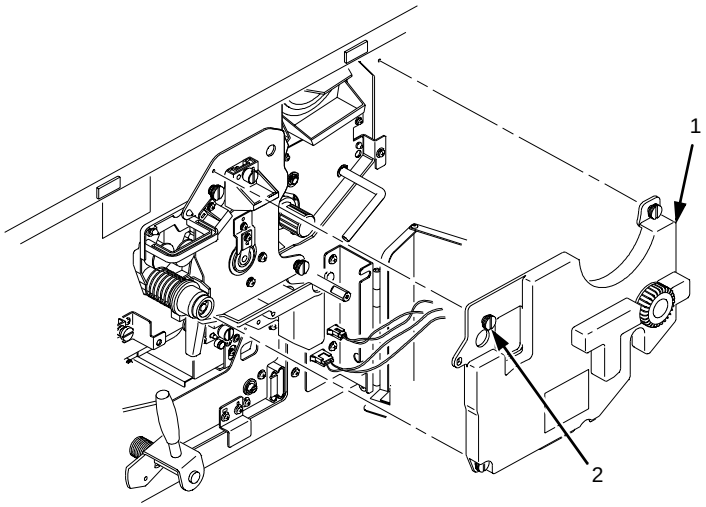
5. Rotate the developing unit lever fully counterclockwise to lock the developing unit in place.



Legend:

1) Positioning Pin
2) Lever
3) Developing Roller Knob

6. Install the upper inner cover, and secure it with the three thumbscrews.



Legend:

1) Upper Inner Cover
2) Thumbscrews (3)

7. Close the waste toner recovery unit and ensure that it latches.
8. Close the printer front cover.

5 *Scheduled Maintenance*

Scheduled Maintenance

In order to perform user maintenance on the printer, you need the following tools:

Item	Part Number
Brush Cleaner	703531-169
Drum Auxiliary Rod	703531-170
Drum Freshener Pad	703531-171
Fuser Cover Glass Scraper	703531-187
Special Dry Tissue Paper	703531-188
Standard Toner Vacuum Cleaner	See recommended models below.
Toraysee Cloth	703531-183
Wire Cleaner	703531-168
9 inch Phillips #1 Screwdriver	N/A

Recommended toner vacuum cleaner models are:

- 3M® model 497-AJM standard VAC with Type 1 filter
- 3M model 497-AB 220V with Type 1 filter
- Hitachi® CV-TN10 with TN-15 filter

Service Level Page Counts

It is important that you maintain a record of all maintenance performed on your printer. Maintenance log sheets are provided in Appendix A. These may be photocopied and kept in a binder near the printer. Be sure to use them each time either you or your service provider perform printer maintenance.

Each time you complete a level of preventive maintenance, you must reset the service level page count by selecting the User Maintenance option on the Maintenance menu. (See page 112.) Levels A, B, and C are your responsibility, while levels D through H are the responsibility of your service provider.

When the page count reaches an increment of one of the maintenance intervals listed below, the control panel displays one of the following messages:

User Maint Level X	(User)
Tech Service Level X	(Service Technician)

Service Level *X* represents the level of service required:

- Level A= every 15,000 pages
- Level B= every 150,000 pages
- Level C= every 600,000 pages
- Level D= every 300,000 pages
- Level E= every 600,000 pages
- Level F= every 900,000 pages
- Level G= every 1,200,000 pages
- Level H= every 2,400,000 pages

A service level includes all levels that precede it. For example, at 150,000 pages, you also do Level B and Level A service.

At 900,000 pages, your service provider must do Level F, Level E, and Level D service.

Service level messages will not cause the printer to stop printing. When one of the above messages appears, do the appropriate scheduled maintenance or call your factory-trained service representative to do the maintenance.

Clearing Service Level Messages

When you have completed a level of service, you must clear the page count for that service level. When you clear a service level, the levels that precede it are also cleared. For example, clearing level C also clears levels A and B.

To clear a service level (level A, for example), select the Maintenance menu from the control panel, select the User Maint option, then select “Clear Level A” by pressing ENTER.

Maintenance

User Cleaning Schedule

Do the actions in the table below after the specified number of letter size pages (4% coverage) have been printed.

Table 3. Parts You Must Clean

Action	Frequency (Pages)	Service Level
General cleaning	15,000	A
Clean the chargers	15,000	A
Clean cover glass	15,000 See Note 1	A
Clean cut sheet cassette pickup rollers and reverse rollers	15,000 See Note 2	A
Major cleaning	150,000	B
Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first. Note 2: Only applies to printers with the cut sheet option installed.		

User Replacement Schedule

The following items should be replaced after the specified number of letter size pages (4% coverage) have been printed.

Table 4. Parts You Must Replace

Item	Part Number	Frequency (Pages)	Service Level
Toner cartridge	703532-001	21,000	As Needed
Waste toner bottle	703539-001	150,000 See Note 1	B
Photoreceptor drum	703535-001	150-300,000 See Note 2	B (as needed)
Developer	703548-001	150,000	B
Cut sheet cassette pickup rollers	703531-050	150,000 See Note 3	B
Cut sheet cassette reverse rollers	703531-051	150,000 See Note 3	B
Developing Unit	705739-001	600,000	C
Note 1: Replace when the “WASTE TONER FULL” indication is made. A guideline for the replacement is every 90,000 pages (A4 size, 4% coverage). Note 2: Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g. labels, card stock, plastic or vinyl) may reduce drum life by as much as 50%. Note 3: Only applies to printers with the cut sheet option installed.			

Tech Service Replacement Schedule

Use the following maintenance kits to replace the listed printer components after the specified number of letter size pages (4% coverage) have been printed.

Level D Maintenance - 300,000 Pages

Item	Part Number
Maintenance Kit, Level D, L5535	**706802-001**
• Main charger • Precharger • Transfer charger • Smoke filter	

Level E Maintenance - 600,000 Pages

Item	Part Number
Maintenance Kit, Level E, L5535	**706803-001**
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Halogen lamp • Transport belt (set of 3) • Cutter motor	

Level F Maintenance - 900,000 Pages

Maintenance Kit, Level F, L5535	706809-001
• Main charger • Precharger • Transfer charger • Smoke filter • Xenon (flash) lamp	

Level G Maintenance - 1,200,000 Pages

Item	Part Number
Maintenance Kit, Level G, L5535	**706815-001**
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Halogen lamp • Transport belt (set of 3) • Cutter motor • Trigger coil unit	

Level H Maintenance-2,400,000 pages

Item	Part Number
Maintenance Kit, Level H, L5535	**706827-001**
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Halogen lamp • Transport belt (set of 3) • Cutter motor • Trigger coil unit • Capacitor • Belt (60S3M264, set of 2) • Sleeve motor unit • Magroll motor unit • Lamp housing filter • EPS1 • EPS3 • EPS4 • Capacitor • Discharge LEDs (PEL) • LED air filter • L5535 Brush kit	

Table 5. Parts The Service Provider Replaces

Item	Part #	Frequency (Pages)	Action	Service Level
Main charger	705741-001	300,000	Replace	D
Precharger	705742-001	300,000	Replace	D
Transfer charger	705743-001	300,000	Replace	D
Smoke filter	703540-001	300,000	Replace	D
Flash power supply filter	n/a	300,000	Clean	D
LED air filter	703543-001	600,000	Clean	E
Lamp housing filter	202838-001	600,000	Clean	E
Cleaning unit	705740-001	600,000 See Note 1	Replace	E
Transporting belt-3	703531-035	600,000	Replace	E
Xenon lamp	703541-001	900,000	Replace	F
Main charger	705741-001	1,200,000	Replace	G
Precharger	705742-001	1,200,000	Replace	G
Transfer charger	705743-001	1,200,000	Replace	G
Cleaning unit	705740-001	1,200,000 See Note 1	Replace	G
Lamp housing filter	202838-001	2,400,000	Replace	H
LED air filter	703543-001	2,400,000	Replace	H
Tractor belt, 3M264	703531-031	2,400,000	Replace	H
Drum belt, 3M264	703531-031	2,400,000	Replace	H
Capacitor **(see Warning below)**	703531-001	2,400,000	Replace	H

Table 5. Parts The Service Provider Replaces

Item	Part #	Frequency (Pages)	Action	Service Level
LED for discharge lamp	703531-561	2,400,000	Replace	H
EPS1 Sensor Lever	703531-585	2,400,000	Replace	H
EPS3 Sensor Lever	703531-588	2,400,000	Replace	H
EPS4 Sensor Lever	703531-067	2,400,000	Replace	H
Note 1: When the cleaning unit has been vacuumed every 150,000 pages and has been used under nominal operating conditions, it must be replaced at 600,000 pages. However, it may need to be replaced more frequently if used for high-density printing or printing on uneven media, or if used under severe operating conditions.				

WARNING **The flash fuser capacitor must be replaced at least every 2,400,000 letter size pages. Failure to do so may endanger equipment and personnel.**

WARNUNG

Der kondensator der Flash-Einbrennvorrichtung muß nach mindestens 2.400.000 Seiten im Format “Letter” ausgetauscht werden. Geschieht dies nicht, ist mit Personen- und Sachschäden zu rechnen.

AVISO

El condensador flash del fusor se debe sustituir como mínimo cada 2.400.000 páginas de tamaño carta. De lo contrario, pueden causarse daños a los equipos y al personal.

ATTENTION

Pour éviter tout risque de dégâs matériels et corporels, remplacez l’unité de flashage aprés l’impression de 2 400 000 pages de format lettre.

AVVERTENZA

Il condensatore dell'unitá fusore deve essere sostituito almeno ogni 2.400.000 pagine in fprmato lettera. La mancata sostituzione puó causare lesione al personale e danni all'apparecchiatura.

CAUTION **Due to the high temperature of the flash fusing unit, keep the area under the fuser free of paper debris.**

General Cleaning

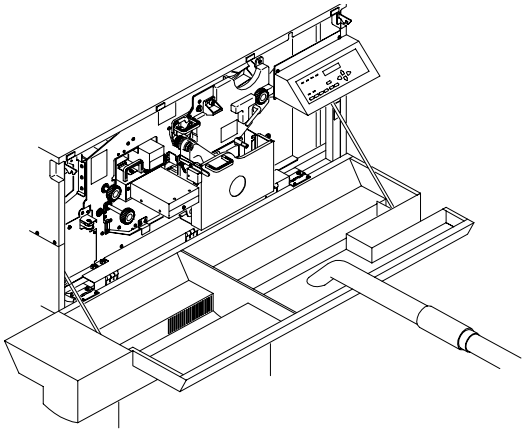
General Cleaning

For best print quality, clean the printer according to the schedule in Table 3, page 162. Depending upon the density of your print jobs, the printer may require cleaning every 10,000-20,000 sheets.

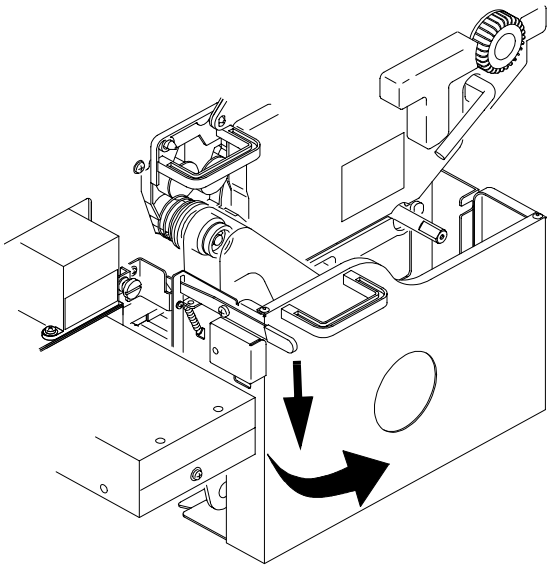
Vacuuming The Printer

Following is the general cleaning procedure:

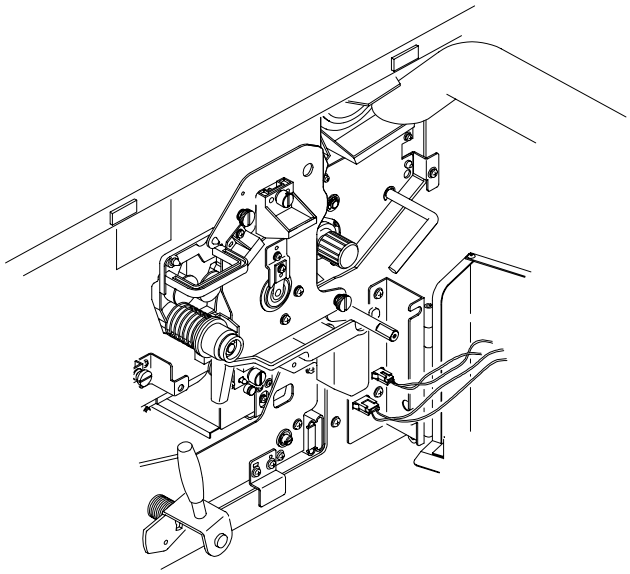
1. Turn the power switch OFF.
2. Open the printer front upper cover.
3. Inside the front cover, vacuum up the toner, paper dust, etc.



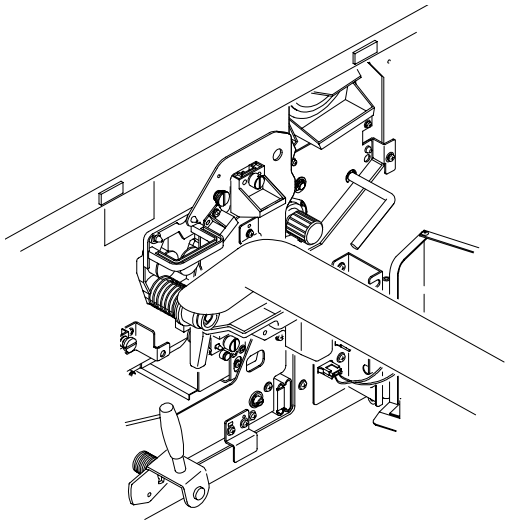
4. On the waste toner recovery unit, press the Open lever down. Pull the handle toward you and open the unit.



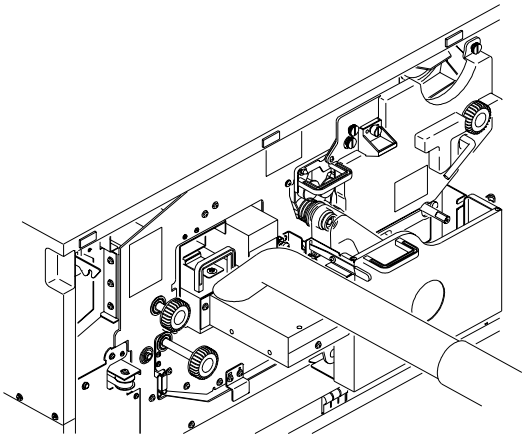
5. Vacuum the developing unit and toner hopper.



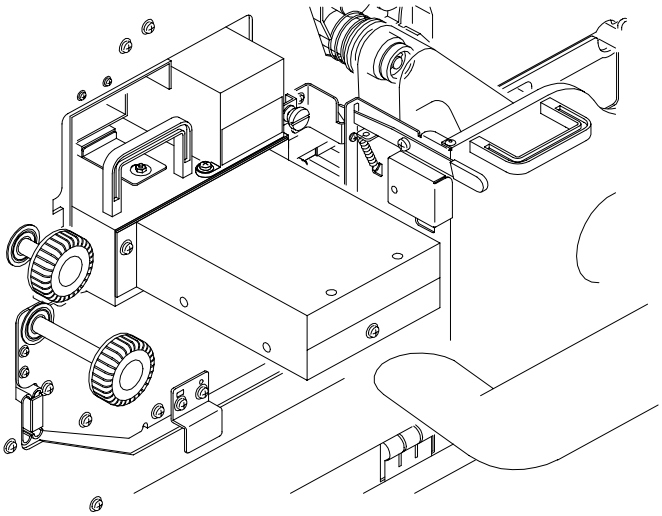
6. Vacuum the cleaning unit.



7. Vacuum the fuser unit.

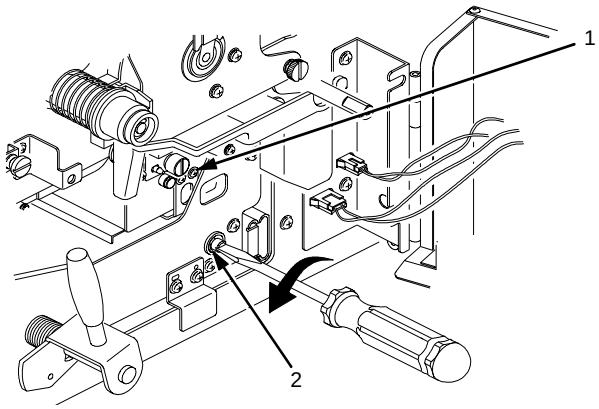


8. Vacuum the lamp housing filter on the underside of the fuser unit.



CAUTION **The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 9 and 10 will damage the drum.**

9. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
   a. If the charger starts to move up, it is already in the down position.
   b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the complete down position.

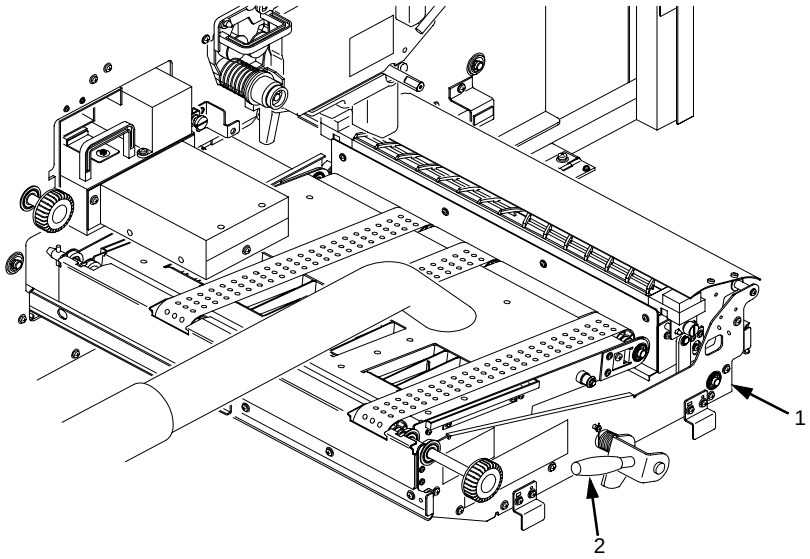


Legend:

1) Transfer Charger
2) Transfer Elevator Drive Shaft

10. Lower the transport surface by turning the green lever on the transport unit to the left.
11. Pull the transport unit toward you until it stops.
12. Using a vacuum, clean the toner, paper dust, etc. Be sure to clean under the transport unit as well.

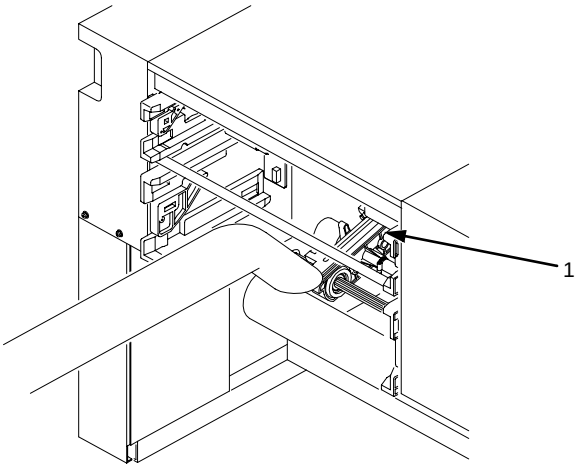
13. Wipe off the dirt on the transport surface with wet tissue paper.
14. Using an ammonia-based wax-free cleaner or rubbing alcohol, clean the belts to remove residue buildup and restore their tacky surface.
15. After cleaning, return the transport unit to its original position (push it into the printer while holding down the green lever). When the transport unit is in position, raise the green lever to the right to raise the transport surface.



Legend:

1) Transport Unit
2) Green Lever

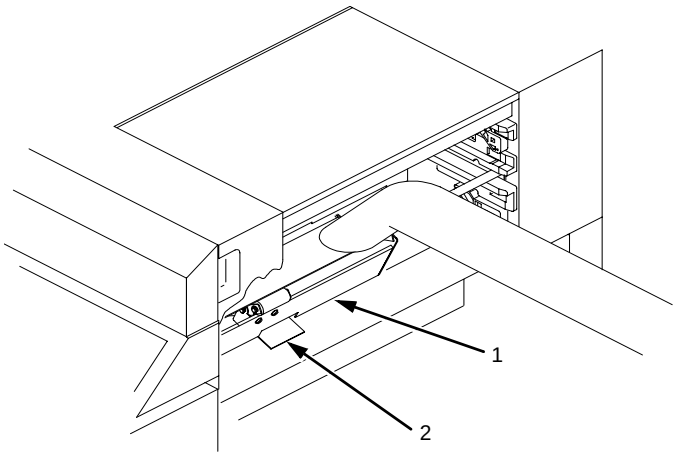
16. Using a vacuum, clean the toner, paper dust, etc. in the tractor area.



Legend:

1) Tractor

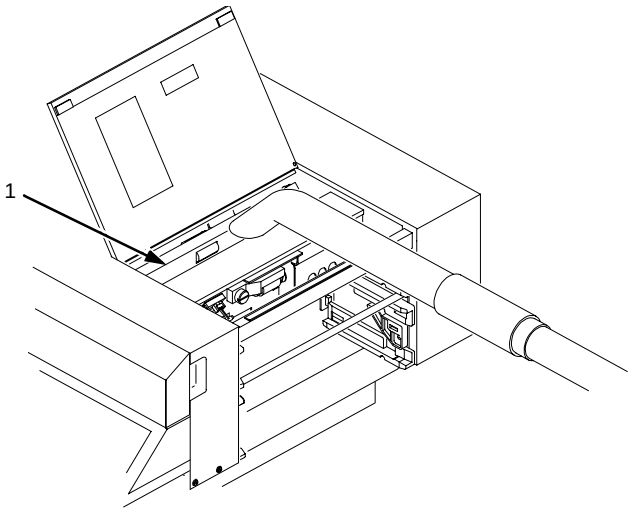
17. Open the paper guide by pressing the green lever down.



Legend:

1) Paper Guide
2) Green Lever

18. Open the lid on the top cover.
19. Open the paper guide by pressing the guide lever down.
20. Using a vacuum, clean the paper dust, etc. inside the paper guide.

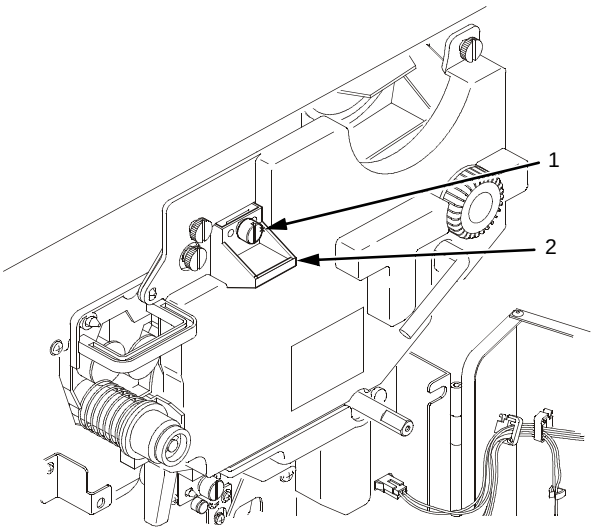


Legend:

1) Paper Guide

Cleaning The Chargers

1. Turn the power switch OFF.
2. Open the printer front upper cover.
3. Loosen the thumbscrew and remove the main charger by pulling it toward you.



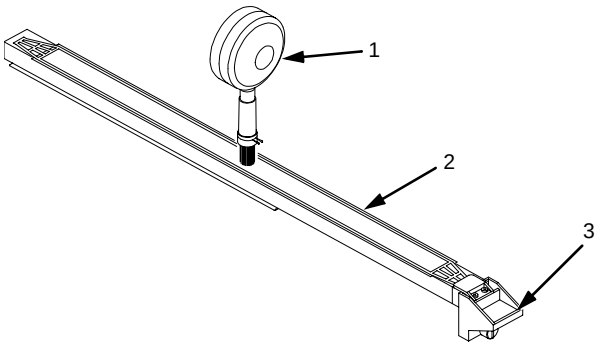
Legend:

1) Thumbscrew
2) Main Charger

4. Place the main charger on a flat, clean work surface.

CAUTION **The charger wires are delicate. Handle the chargers with care.**

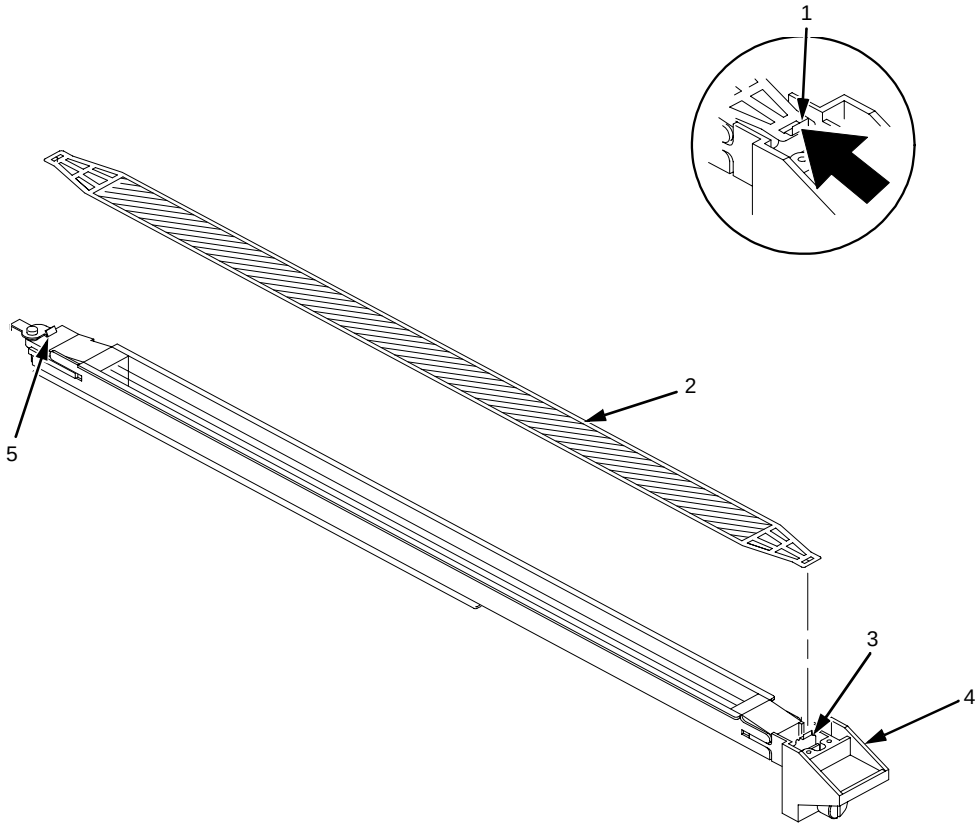
5. Using the brush cleaner (listed on page 159), clean the exposed side of the charger grid and the body of the main charger to remove paper dust, etc., as shown below.



Legend:

1) Brush Cleaner
2) Charger Grid
3) Main Charger

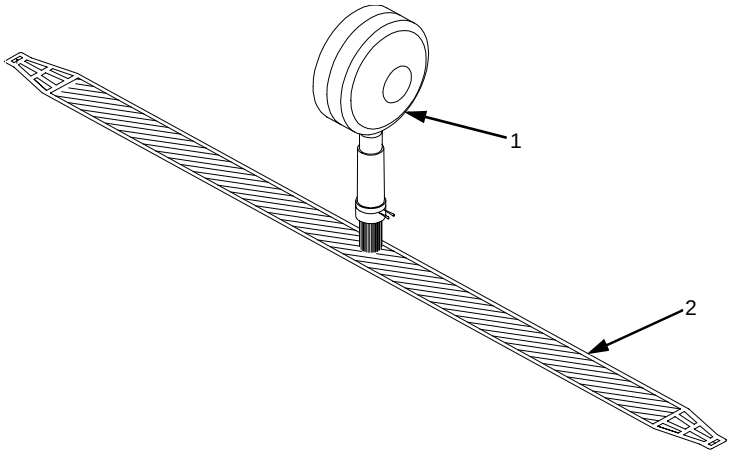
6. Position the main charger with the charger grid up and the front end of the charger toward you, as shown in the figure below. Refer to the figure below and the inset drawing in the figure, and remove the charger grid from the main charger as follows:
   a. While pressing the front retaining tab toward the rear of the charger, unhook the rear end of the charger grid from the rear retaining tab.
   b. Release the front retaining tab, then remove the charger grid from it.



Legend:

1) Front Retaining Tab (Inset Drawing)
2) Charger Grid
3) Front Retaining Tab
4) Main Charger
5) Rear Retaining Tab

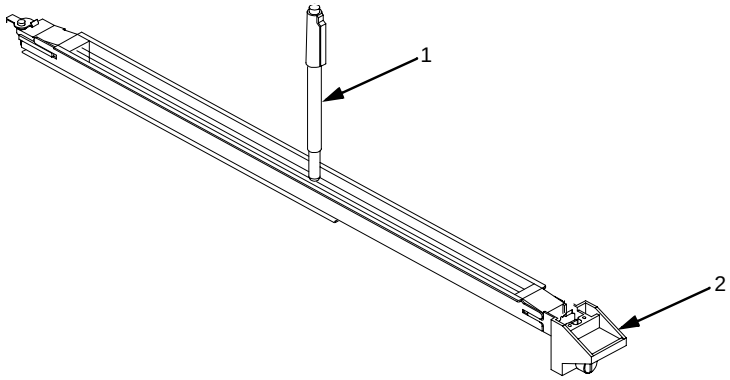
7. Using the brush cleaner, clean both sides of the charger grid, as shown below.



Legend:

1) Brush Cleaner
2) Charger Grid

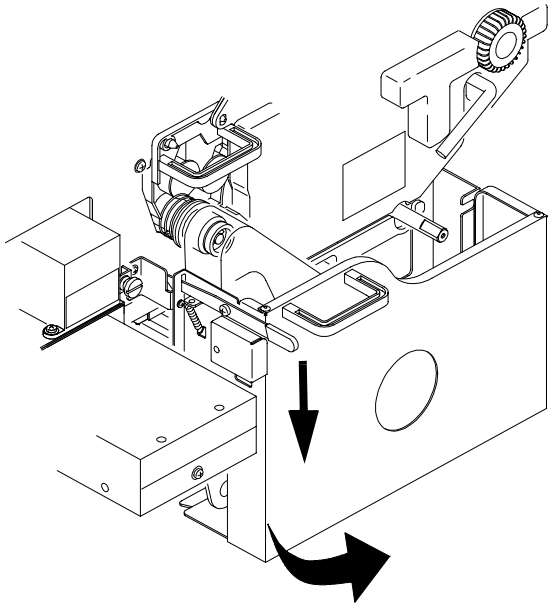
8. Using the wire cleaner (listed on page 159), clean the two wires in the main charger, as shown below. Clean both wires thoroughly. When dirt is caked on, the wires feel gritty. When clean, the wires feel smooth.



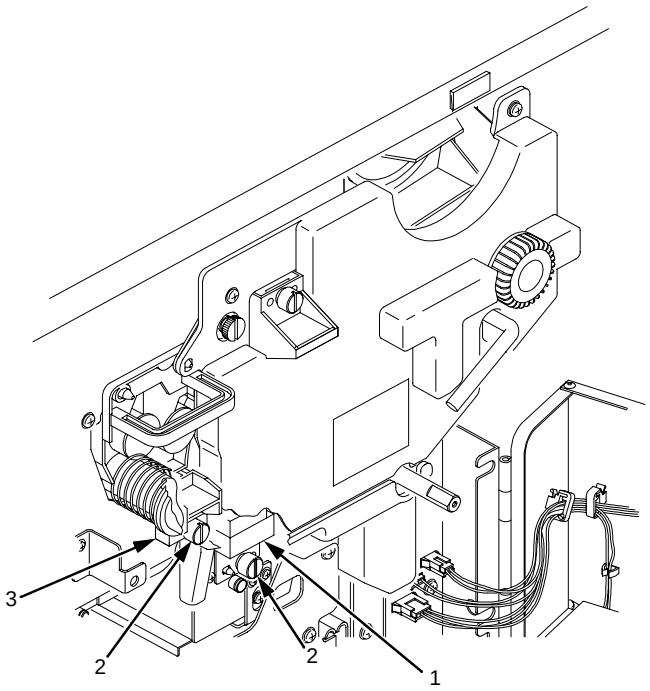
Legend:

1) Wire Cleaner
2) Main Charger

9. Reinstall the charger grid.
10. Return the main charger to its original position. Fasten the main charger screw to secure it.
11. Open the waste toner recovery unit.



12. Loosen the thumbscrews (2), precharger screw and transfer/ separator charger screw, and remove the chargers by pulling them toward you.



Legend:

1) Transfer/Separator Charger
2) Thumbscrews
3) Precharger

13. Place the chargers on a flat, clean work surface.
14. Using the brush cleaner and the wire cleaner, clean the chargers by removing the dust and dirt on the wires. (The precharger contains one wire, while the transfer/separator charger contains two wires.)
15. After cleaning, return the chargers to their original positions. Fasten the charger screws to secure them.

Cleaning The Fuser Unit Cover Glass

WARNING **The fuser unit remains hot after operation. Wait until it has *completely* cooled down before handling it.**

WARNUNG

Die Einbrennvorrichtung behält auch nach dem Betrieb ihre Temperatur bei. Fassen Sie sie erst an, wenn sie *vollständig* abgekuhlt ist.

AVISO

La unidad de fusor estará a alta temperatura después de funcionar. Espere a que se haya en friado *por completo* antes de manipularia.

ATTENTION

L'unité de four est encore trés chaude aprés chaque opération. Attendez qu'elle refroidisse complétement avant de la manipuler.

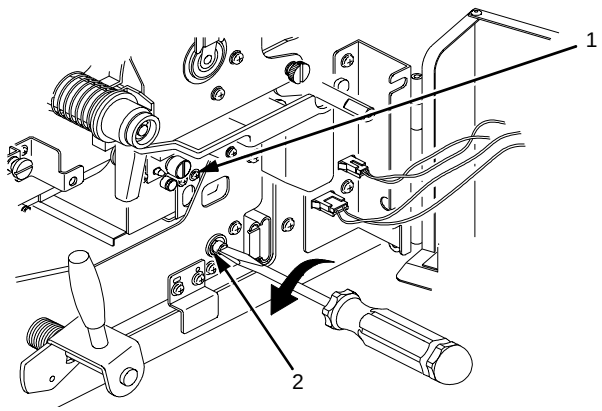
AVVERTENZA

Dopo l'uso, l'unitá fusore é calda. Attendere il *completo* raffeddamento dell'unitá prima di intervenir sulla medesima.

1. Turn the power switch OFF.
2. Open the printer front upper cover.

CAUTION **The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 3 and 4 will damage the drum.**

3. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
   a. If the charger starts to move up, it is already in the down position.
   b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the complete down position.

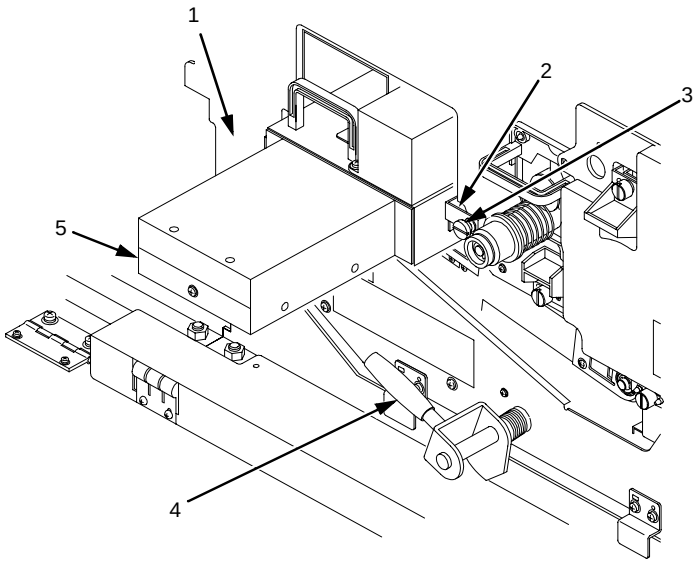


Legend:

1) Transfer Charger
2) Transfer Elevator Drive Shaft

4. Lower the transport surface by turning the green lever on the transport unit to the left.

5. Loosen the thumbscrews on the right and left fuser unit holding plates.



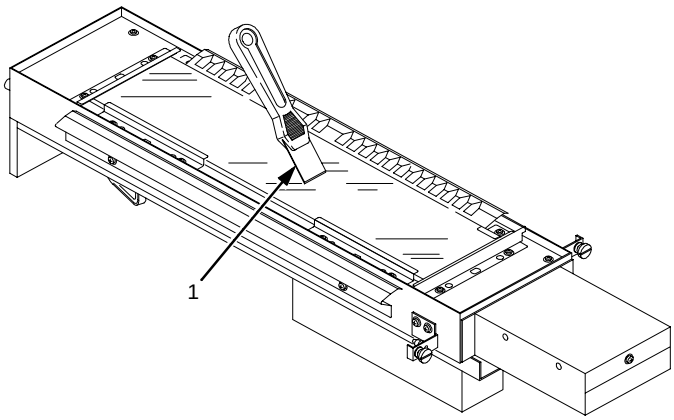
Legend:

1) Thumbscrew (2 places not visible)
2) Holding Plate
3) Thumbscrew
4) Green Lever
5) Fuser Unit

6. Grasp the handle and pull out the fuser unit until the second handle is visible.
7. Grasp the second handle with your other hand and remove the fuser from the printer.
8. Place the fuser on a clean, flat surface with the cover glass facing up.

CAUTION **Do not scratch or place your hands directly on the cover glass. Fingerprints on the cover glass or lamps will cause them to break.**

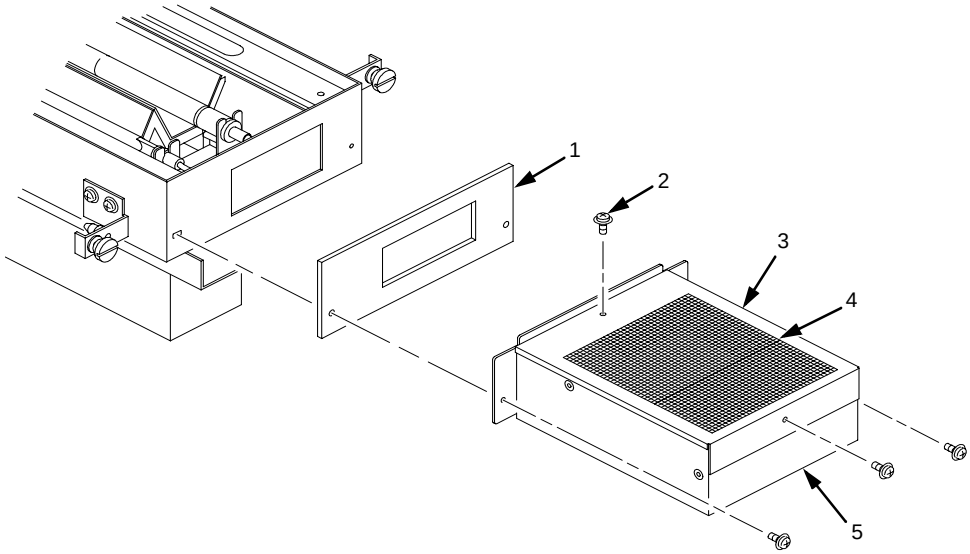
9. Using the fuser cover glass scraper (listed on page 159), remove the dirt and toner buildup on the cover glass surface.
10. Wipe away any remaining toner or dirt with a Toraysee cloth (listed on page 159).



Legend:

1) Scraper

11. Remove the two screws that secure the lamp duct filter unit to the fuser, then remove the lamp duct filter unit and the foam gasket. Remove the two screws that secure the filter holding plate to the lamp duct filter unit, then remove the lamp filter.



Legend:

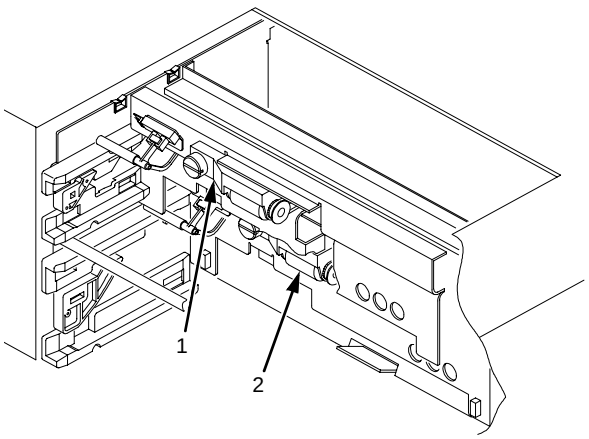
1) Foam Gasket
2) Screws (4)
3) Filter Holding Plate
4) Lamp Filter (Air Filter)
5) Lamp Duct Filter Unit

12. Vacuum the lamp filter, then reinstall it.
13. Vacuum any paper dust from the printer frame.
14. Aligning the guide pins in the screw bracket with the holes in the side frame of the printer, install the fuser.

Cleaning The Cut Sheet Option Rollers

NOTE: This procedure only applies to printers with the cut sheet option installed.

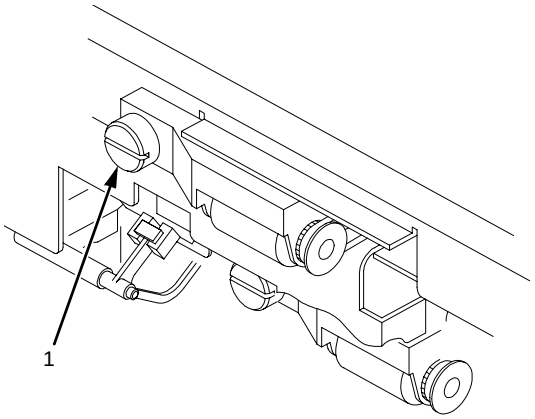
1. Turn the power switch OFF.
2. Remove the upper and lower paper cassettes from the printer.
3. There are two pickup roller units (upper and lower) located at the back of the cassette opening.



Legend:

1) Upper Pickup Roller Unit
2) Lower Pickup Roller Unit

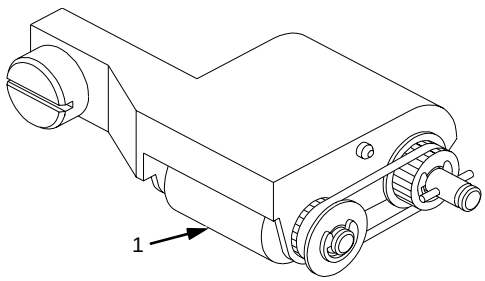
4. On the upper roller unit, loosen the green thumb screw. Slide the unit to the left, and pull the unit toward you and out of the printer.



Legend:

1) Green Thumbscrew

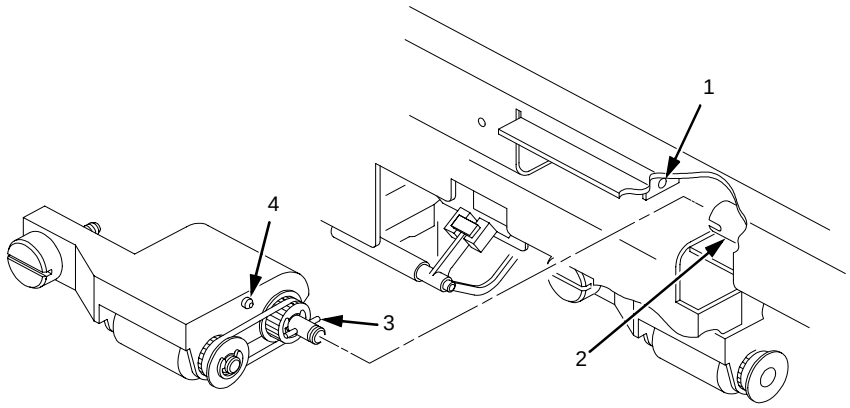
5. On the lower roller unit, loosen the green thumb screw. Slide the unit to the left, and pull the unit toward you and out of the printer.
6. Wipe off the dirt on the pickup rollers with a Toraysee cloth (listed on page 159). Remove any label adhesive or forms residue with rubbing alcohol.



Legend:

1) Roller

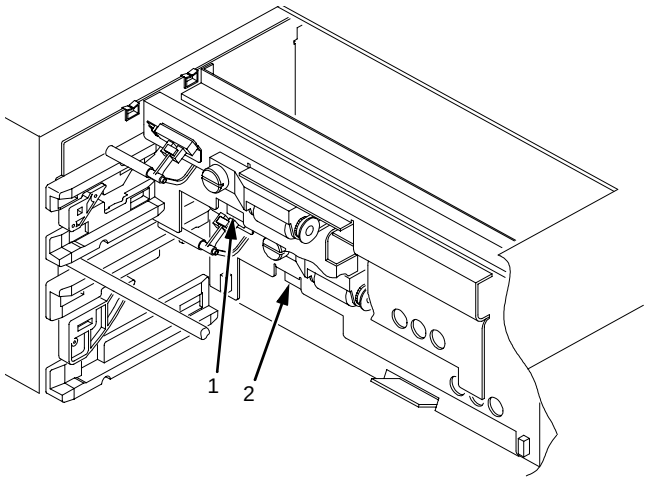
7. Install the upper and lower pickup roller units:
   a. Align the shaft pin with the slot in the coupling, and align the alignment pin on the unit with the hole in the frame.
   b. Tighten the green thumb screw.



Legend:

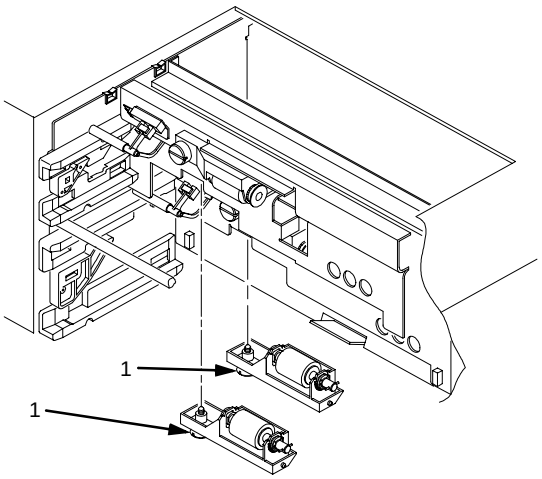
1) Hole in Frame
2) Coupling
3) Shaft Pin
4) Alignment Pin

8. There are two reverse roller units (upper and lower) located at the back of the cassette opening (underneath the upper and lower pickup roller units).



1) Upper Reverse Roller Unit
2) Lower Reverse Roller Unit

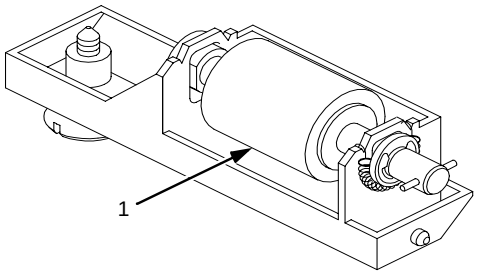
9. On the upper reverse roller unit, loosen the green thumb screw. Remove the roller unit by moving it downward while sliding it to the left.



Legend:

1) Thumbscrews

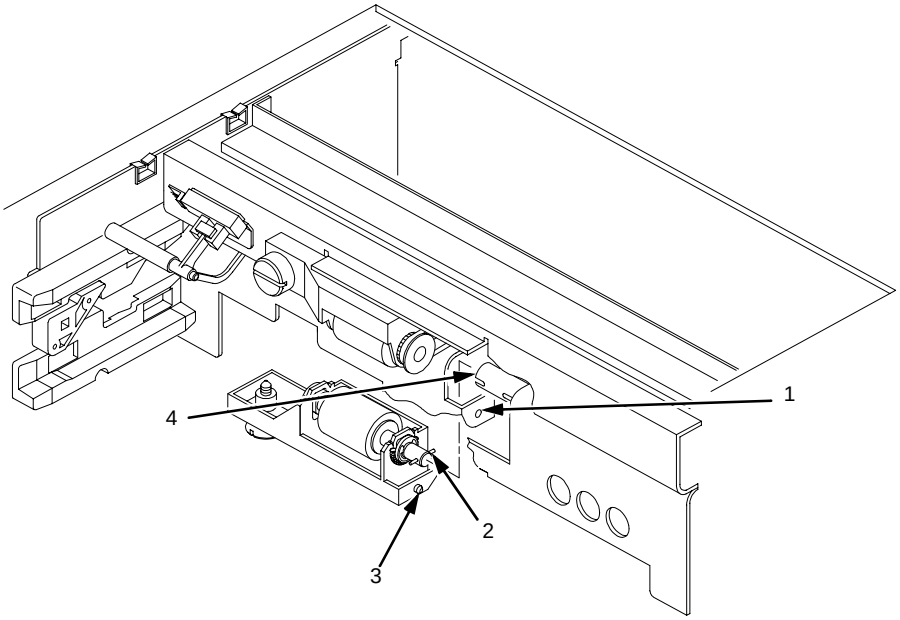
10. On the lower reverse roller unit, loosen the green thumb screw. Remove the roller unit by moving it downward while sliding it to the left.
11. Wipe off the dirt on the reverse rollers with a Toraysee cloth (listed on page 159). Remove any label adhesive or forms residue with rubbing alcohol.



Legend:

1) Roller

12. Install the upper and lower reverse roller units:
    a. Align the shaft pin with the slot in the coupling, and align the alignment pin on the unit with the hole in the frame.
    b. Tighten the green thumb screw.



Legend:

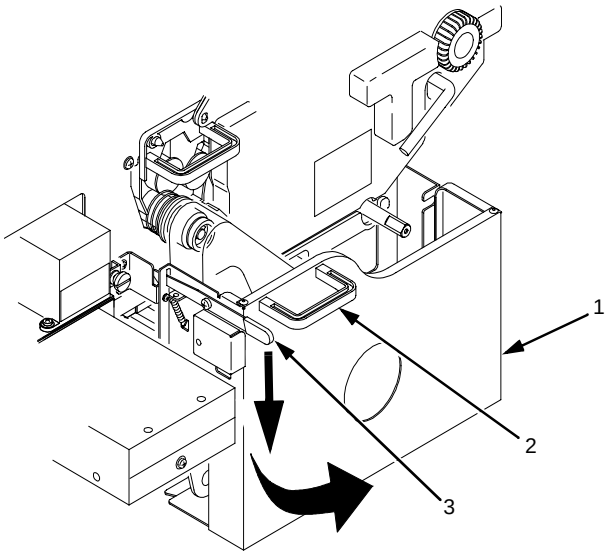
1) Hole in Frame
2) Shaft Pin
3) Alignment Pin
4) Coupling

13. Install the upper and lower paper cassettes into the printer.

Major Cleaning

Major Cleaning

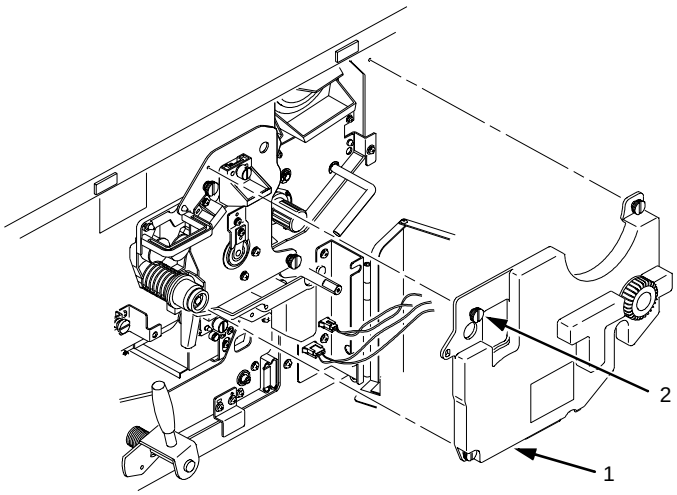
1. Turn the power switch OFF.
2. Open the printer front upper cover.
3. Open the waste toner recovery unit by pushing downward on the lever. Pull the green handle and swing the unit outward away from the printer.



Legend:

1) Waste Toner Recovery Unit
2) Green Handle
3) Opening Lever

4. Loosen the three thumbscrews on the upper inner cover. Then remove the cover.

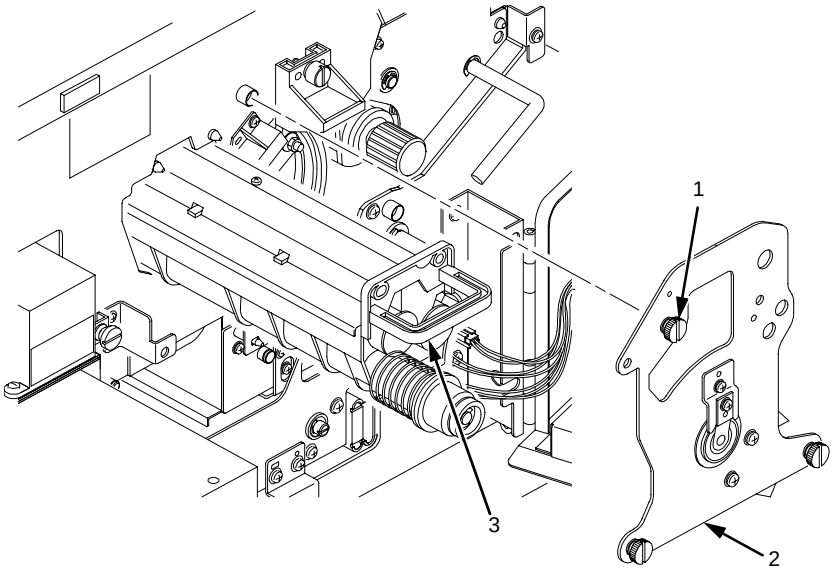


Legend:

1) Upper Inner Cover
2) Thumbscrews (3)

5. Loosen the three thumbscrews securing the drum plate and remove the drum plate.

CAUTION **Do not turn the cleaning unit upside down, or toner might spill. Do not touch the brush surface with your hand.**

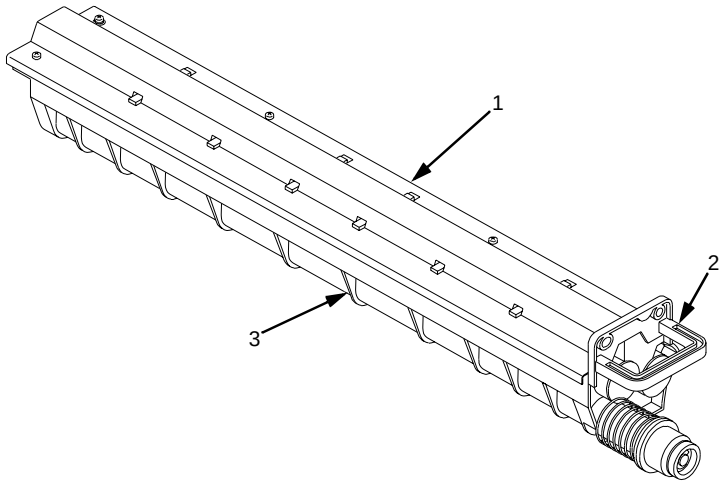


Legend:

1) Thumbscrews (3)
2) Drum Plate
3) Cleaning Unit Handle

6. Remove the cleaning unit by grasping its handle and pulling it toward you.

7. Vacuum the brush on the cleaning unit. Turn the end of the shaft to rotate the brush. Continue to rotate and vacuum the brush until the entire brush surface is cleaned.



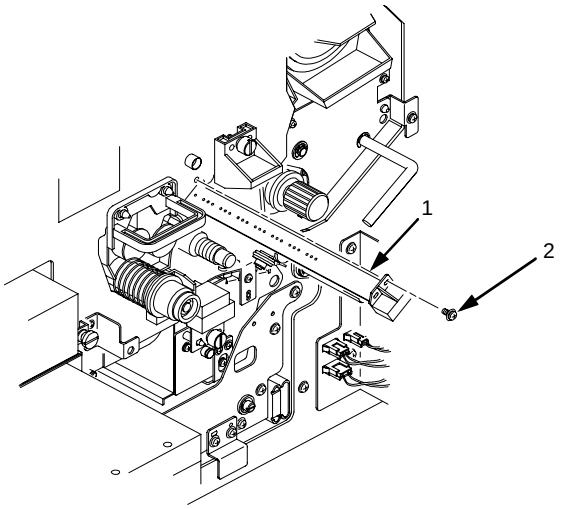
Legend:

1) Cleaning Unit
2) Cleaning Unit Handle
3) Brush

8. Remove the discharge LED retaining screw.

CAUTION **Do not flex the discharge LED as it will break**

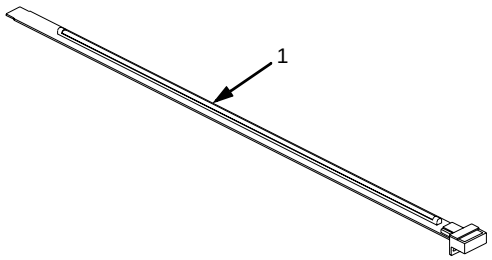
9. Remove the discharge LED by pulling it toward you.



Legend:

1) Discharge LED
2) Screw

10. Using a Toraysee cloth (listed on page 159), wipe off the dirt on the discharge LED.



Legend:

1) Discharge LED

11. Install the discharge LED.

Cleaning The Photoreceptor Drum

1. Remove the photoreceptor drum. See page 136.
2. Place the photoreceptor drum on a covered work surface.
3. If the drum is only slightly dirty, clean it with ethanol or isopropyl alcohol. **Do not use acetone.**

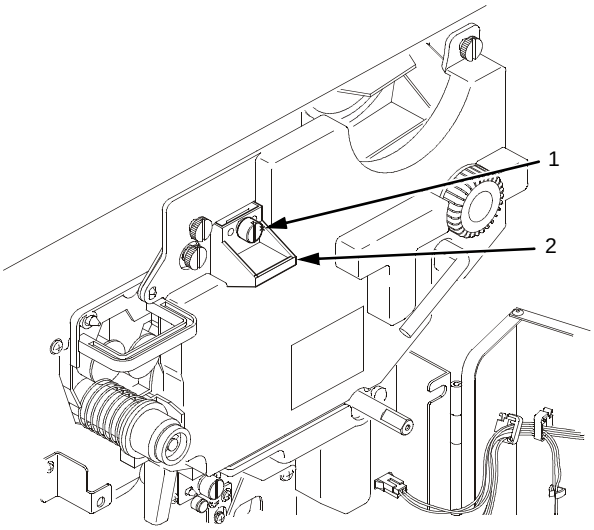
CAUTION **When cleaning the photoreceptor drum, note the following:**

- **Do not touch the drum surface with your hands.**
- **To prevent the drum surface from being scratched, clean it in a location free of dust.**
- **Cleaning the drum may result in stains. A drum left unused in the printer for a long time after cleaning may especially be affected. Therefore, after cleaning and installing the drum in the printer, use maximum size paper to print an image repeatedly until no stains remain. Stains will usually be cleared after printing a few dozen pages.**
- **Press lightly when polishing the drum surface, as too much pressure can damage the drum.**

4. If the drum contains toner build-up, clean it with the drum freshener pad (listed on page 159). Turn the drum little by little while polishing the drum surface with the freshener pad. Polish with a slight force in the direction of the drum axis, using a circular motion. Let the polished areas slightly overlap each other, and polish the entire drum surface two or three times repeatedly.
5. Using the special dry tissue paper (listed on page 159), thoroughly wipe the drum freshener off the drum surface.
6. Wipe the drum surface again using a Toraysee cloth.
7. To avoid exposing the drum to light for a prolonged period of time, temporarily pack the drum in its original packaging material, and close the box cover. Set the drum aside for now. (It will be installed in a later step.)
8. Remove the drum auxiliary rod from the drum shaft.
9. Wipe the drum shaft clean with a cloth.

Cleaning The Developing Unit

1. Loosen the thumb screw and remove the main charger by pulling it toward you.



Legend:

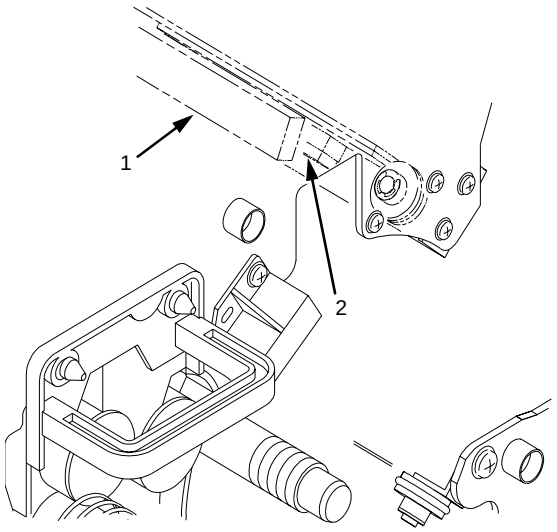
1) Thumbscrew
2) Main Charger

2. Clean the developing unit area with a vacuum cleaner and a soft cloth.

CAUTION **Do not to apply too much force to the drum surface potential sensor located near the SELFOC® lens, as this can dislocate the sensor. (If this happens, contact your service representative.)**

3. Wipe the SELFOC lens by moving the unused side of a Toraysee cloth from the inner part of the printer toward you. Wipe the lens in this manner several times until there is no more dirt on the cloth.

NOTE: Always wipe the SELFOC lens with the unused side of the Toraysee.



Legend:

1) SELFOC Lens
2) Drum Surface Potential Sensor

4. Install the main charger.
5. Install the photoreceptor drum. See page 136.
6. Install the developing unit. See page 155.
7. Install the cleaning unit.

Chapter 5 Major Cleaning

6 *Troubleshooting*

Troubleshooting

This chapter discusses diagnostic tests, paper jams, and system messages (status and error).

Maintaining Print Quality

To maintain good print quality, clean the printer according to the schedules and procedures listed in Chapter 5.

1. Do a General Cleaning (page 172).

NOTE: Recommended toner vacuum cleaner models are listed on page 159.

2. Clean the main charger, precharger, and transfer charger. For cleaning instructions, see page 180.
3. If the printer is equipped with the cut sheet option, clean the pickup rollers and the reverse rollers inside the cut paper unit, using the Toraysee cloth. For cleaning instructions, see page 191.
4. Clean the following areas with the designated tools:

   - Clean the drum with the drum freshener (only when smears appear on print samples due to the drum).
   - Clean the LED array and the SELFOC® lens (LED print head) with the Toraysee™ cloth.
   - Clean the fuser cover glass with a razor blade or the cover glass scraper.

For specific details, refer to the cleaning procedures in this chapter.

If cleaning the printer doesn't improve print quality, the chargers may need to be replaced. Contact your authorized service representative for further assistance.

NOTE: For replacement intervals, see the maintenance schedules that begin on page 162. For replacement procedures, see Chapter 4, "Consumables Replacement."

Diagnostics

The printer includes self-diagnostic circuits and software to aid in the discovery, prevention, and correction of system problems and failures. The printer has both offline and on-line diagnostics.

Offline Diagnostics

Most of the software diagnostics are executed when the printer is powered on, and when you request diagnostic information through the control panel.

Each time the printer is powered on, it performs a power-on self test. There is no printout during this test. However, the printer displays any errors on the control panel, accompanied by an audible alarm.

You can request the following diagnostic and configuration information via the control panel, through various menus:

- Test Print: Prints various predefined graphics pages to verify that the printer can print properly on the entire page (Test Print menu).
- Print Statistics: Displays all accumulated print engine statistics, such as number of pages printed and power-on time. This is a display-only feature; there is no printout (Print Statistics menu).
- Print Configuration: Prints all current configuration parameters in the printer, including print statistics (Config. Control menu).

Online Diagnostics

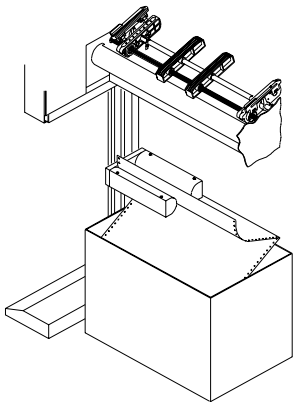
When online, the printer continues to sense and report problems or conditions as they arise. When an error is detected, the printer halts, lights the appropriate LED, and displays the proper error message on the control panel. The error message will remain displayed until the error condition is cleared and you press CLEAR.

After the error is cleared, the printer will reprint any pages that were not ejected prior to the error, provided the Reprint on Fault option is enabled. (See the Paper Control menu on page 96 in Chapter 3, “Printer Configuration.”)

Fanfold Paper Jams

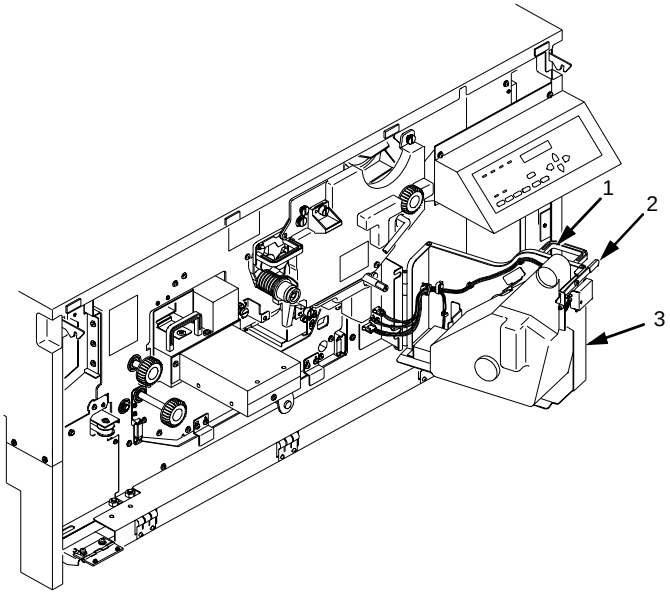
Paper Jam Near The Tractor

1. Raise the tractor gates.
2. Pull out the jammed paper. If the end of the paper is crumpled, tear it away from the perforation.
3. Reload paper with the first fold towards the printer, as shown below. Do not push the paper past the tractors into the area of the paper jam sensor.



Paper Jam Near The Paper Output Section

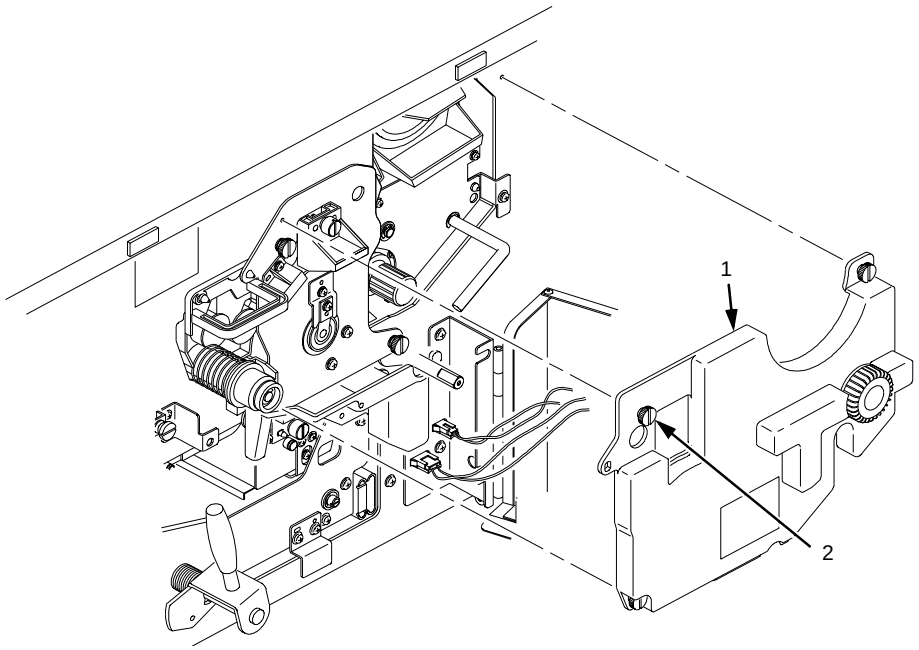
1. When paper motion stops, wait 15 seconds, then open the front cover.
2. Push down on the opening lever of the waste toner recovery unit, and pull the green handle to swing the unit outward.



Legend:

1) Green Handle
2) Opening Lever
3) Waste Toner Recovery Unit

3. Loosen three thumbscrews on the upper inner cover. Then remove the cover.



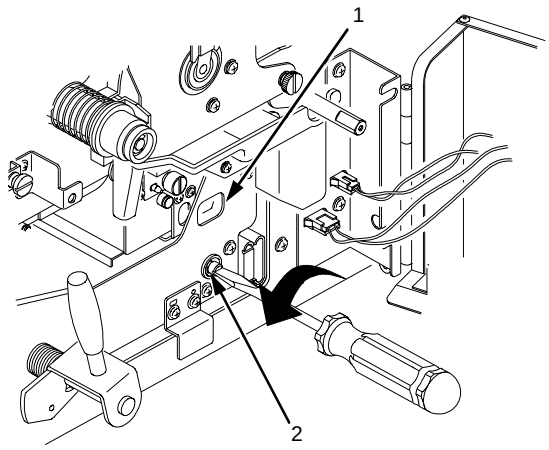
Legend:

1) Upper Inner Cover
2) Thumbscrews (3)

CAUTION **The transfer charger must be in the down position to avoid scratching the drum**

4. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
   a. If the charger starts to move up, it is already in the down position.

b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the fully down position.

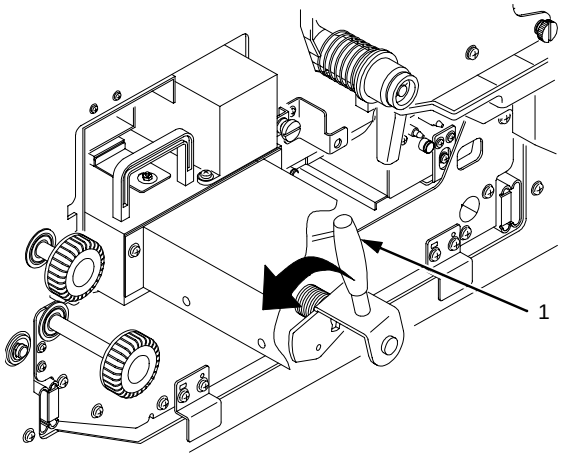


Legend:

1) Transfer Charger
2) Transfer Elevator Drive Shaft

CAUTION **To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before opening the transport unit.**

5. Lower the transport unit by turning the green lever on the transport unit to the left. Pull the transport unit toward you until it stops.

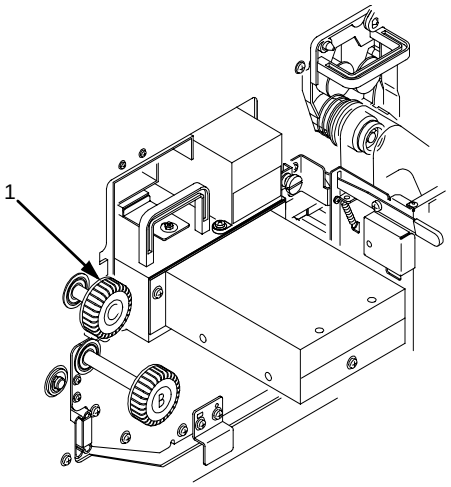


Legend:

1) Green Lever

6. Check to see if any paper is jammed.

7. To raise the scuff roller holding the paper, turn knob C clockwise 90° as shown below.



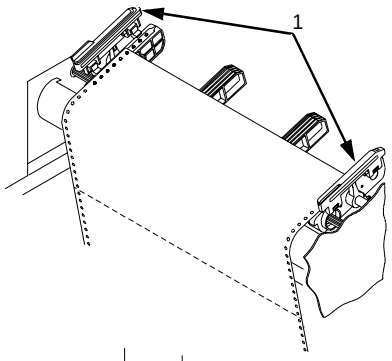
Legend:

1) Knob C

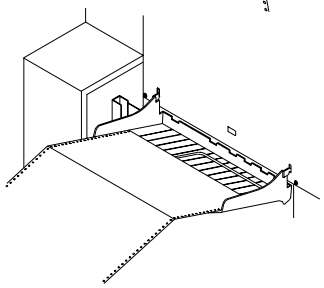
8. Separate the paper at the perforations on both the paper input and the output sections. Then pull the jammed paper out.

When removing the paper from the paper input section, raise the tractor gates first, then pull out the jammed paper.

Input Section



Output Section



Legend:

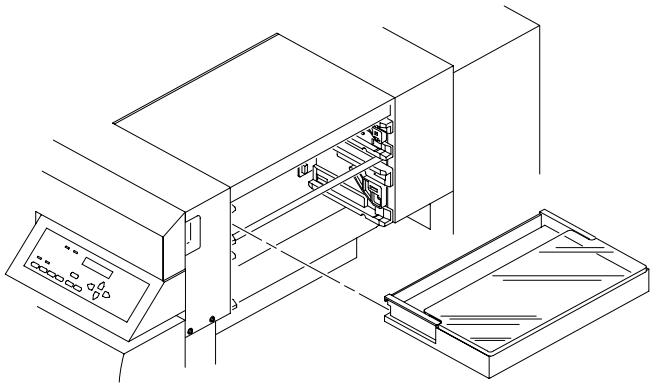
1) Tractor Gate

CAUTION **To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before closing the transport unit.**

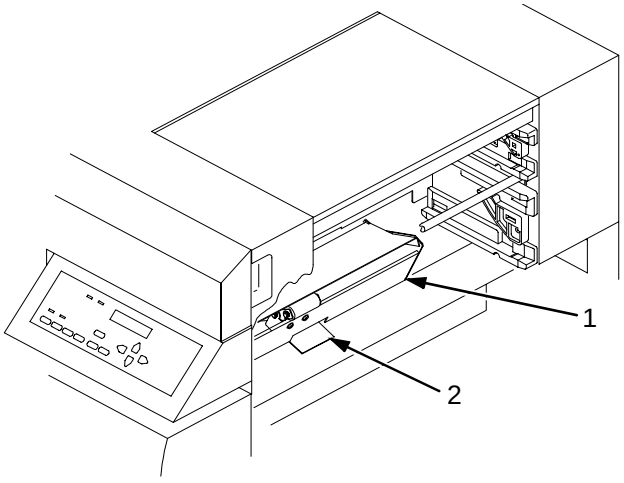
9. After removing the pieces of jammed paper, restore the transport unit, waste toner recovery unit, and knob C to their original positions, and close the front cover.
10. Reload the paper.

Cut Sheet Paper Jams

1. Pull out the paper cassette.



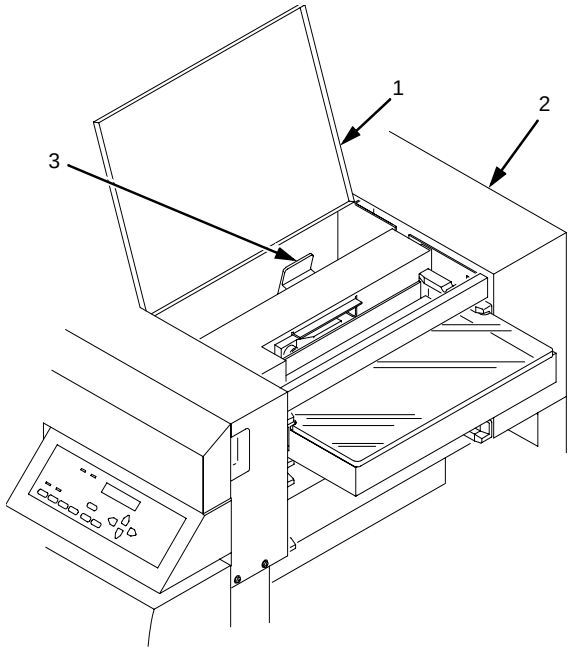
2. To lower the paper guide, pull the green lever up. Remove any jammed paper, and return the green lever to its original position.



Legend:

1) Paper Guide
2) Green Lever

3. Open the lid on the top cover, and pull the green lever up. Remove any jammed paper, and return the green lever to its original position.



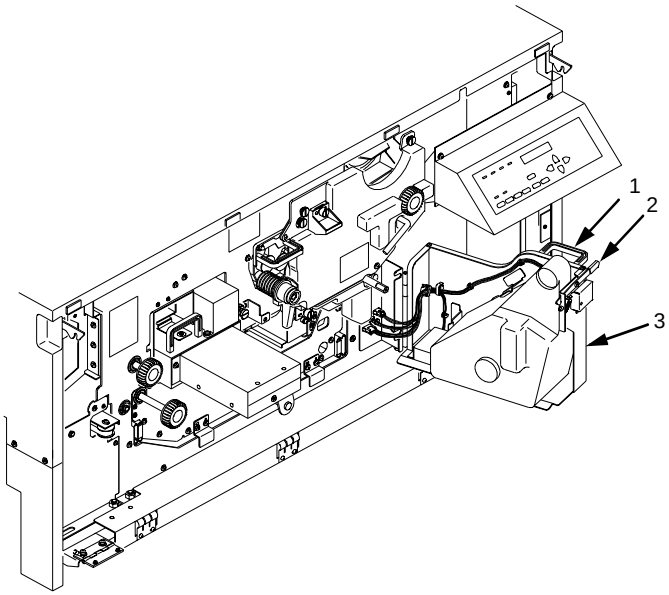
Legend:

1) Lid
2) Top Cover
3) Green Lever

Paper Jam In The Transport Input Section

1. When paper motion stops, wait 15 seconds, then open the front cover.

2. Open the waste toner recovery unit cover, and swing out the unit.

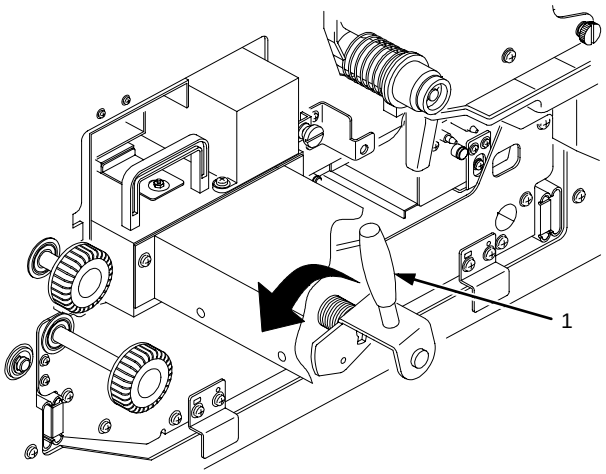


Legend:

1) Green Lever
2) Opening Lever
3) Waste Toner Recovery Unit

CAUTION To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before opening or closing the transport unit.

3. To lower the transport route surface, turn the green transport unit lever to the left.

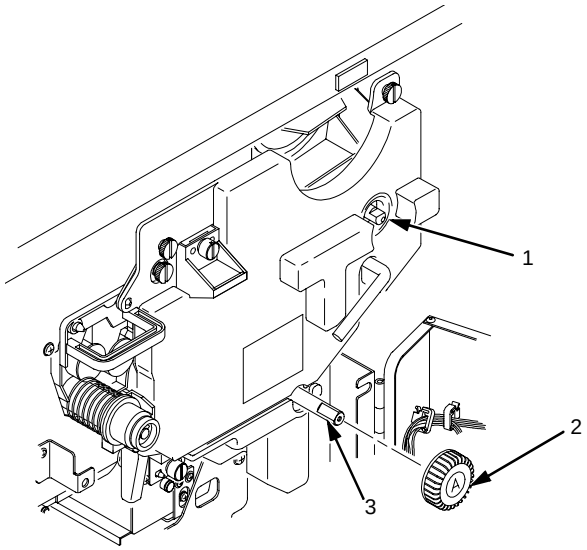


Legend:

1) Green Lever

4. Remove knob A from its place as shown below. Attach knob A to the paper feed shaft, and turn knob A counterclockwise. This causes the jammed paper to be moved to the eject side.

Remove any jammed paper, and return knob A to its original position.



Legend:

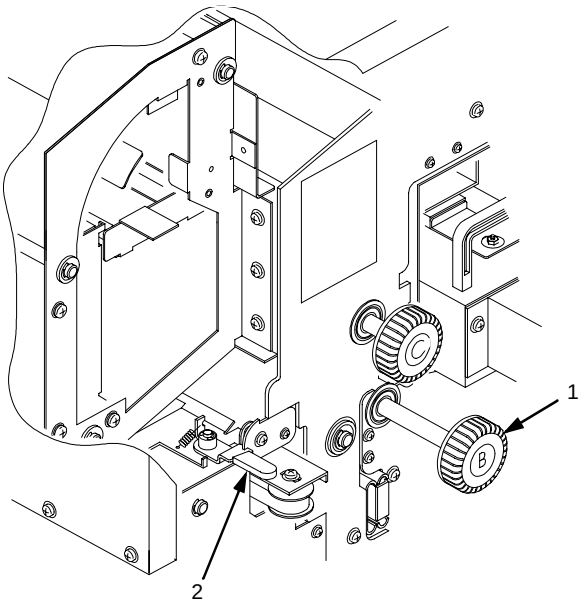
1) Original Position of Knob A
2) Knob A
3) Paper Feed Shaft

5. Restore the transport unit and the waste toner recovery unit to their original positions, and close the front cover.

Paper Jam In The Transport Output Section

1. When paper motion stops, wait 15 seconds, then open the front cover. (See page 130.)
2. Pull up the bottom lever to raise the paper guide, and turn the green knob B counterclockwise. This moves the jammed paper to be removed to the paper feed section. Remove any jammed paper.

3. Lower the paper guide by restoring the bottom lever to its original position. Close the front cover.



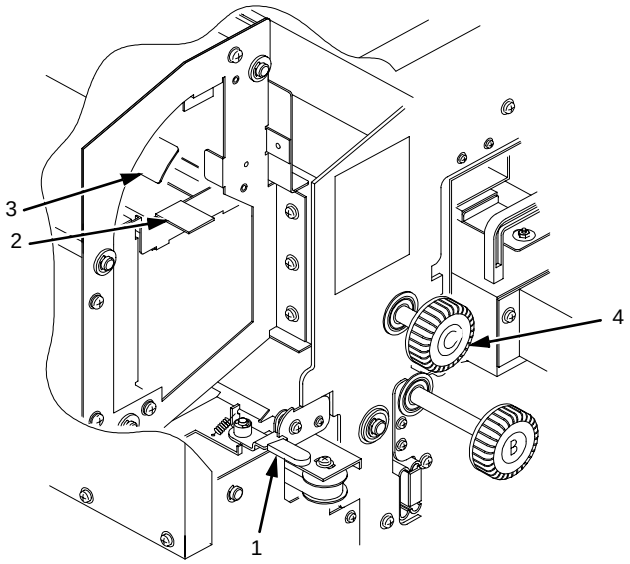
Legend:

1) Knob B
2) Bottom Lever

Paper Jam In Face Up Or Down Paper Path

1. When paper motion stops, wait 15 seconds, then open the front cover.
2. Push the top lever #3 and middle lever #2 down. Pull bottom lever #1 up to raise the paper guide. Turn the green knob C

clockwise, and remove any jammed paper. (Levers are numbered on a label inside the printer, as shown.)



Legend:

1) Bottom Lever #1
2) Middle Lever #2
3) Top Lever #3
4) Knob C

3. Restore the levers #1, #2, #3 to their original positions, and close the front cover.

System Status And Error Messages

When an error occurs, the printer displays an appropriate message on the control panel LCD. Some errors are operator-correctable, some require field service, and others require the print job be run again.

Operator-correctable errors include paper jams, missing consumables, and power paper stacker problems. After correcting the error condition, press CLEAR to remove the message from the display and place the printer offline. If any data resides in the print

buffer, it will then be printed. Press ONLINE to place the printer online.

The “stacker” errors can usually be cleared by pressing CLEAR. In some cases, you may need to lower and then raise the stacker tray, then press CLEAR to correct the error.

Errors requiring field service are printer failures that require the attention of service personnel. Before calling your service representative, press CLEAR to attempt to remove the message from the display. If the message disappears, the original message may have been a false error indication. If the message reappears, call for service.

Errors requiring reprinting are those errors which require reprinting to recover from an error condition. These are discussed in detail in the following topics.

IMPORTANT **The stacker is reset automatically whenever you clear a paper fault (paper jam or fanfold paper empty) error.**

Reprinting Pages After Fault Condition

The printer handles errors in three ways, depending on your configuration of the Reprint on Fault option in the Paper Control menu.

If Reprint on Fault is *enabled* (the default):

Any pages left in the printer at the time of failure will be reprinted. No data is lost.

Fanfold paper: the printer reprints all pages that have not completely exited the printer at the time of failure. The exact number of pages that are reprinted is determined by the length of the page and where within the page the fault occurred.

Cut sheet paper: the printer determines how many pages did not exit the printer, and reprints all pages that did not exit.

If Reprint on Fault is *disabled:*

Any pages left in the printer at the time of failure will not be reprinted. Data is lost. (you will need to reprint the lost pages according to your application software.)

If Reprint on Fault is *confirm*:

The control panel on the printer returns a message asking whether or not to reprint. Answer Yes to reprint, answer No if a reprint is not necessary.

Whether Reprint on Fault is enabled or disabled, or confirm:

After a paper jam, you may need to reload the paper onto the tractors.

Table 6, “Error Messages,” on page 228, designates those errors that require reprinting to recover from an error condition.

NOTE: Some errors require reprinting, regardless of your printer configuration.

Procedure For Fault Clearing - Reprint On Fault *Disabled*

1. A fault occurs.
2. Correct the fault condition.
3. Press CLEAR.
4. The STAND BY LED blinks and the following message appears while the printer attempts to clear the fault:

   ```
   Standby ...
   Clearing Fault
   ```

   - If the fault is not cleared:

   a. The printer beeps and briefly displays the following message:

   ```
   Faults Not Cleared
   ```

   b. The printer then redisplays the original fault message, or any other uncleared fault message.

c. Attempt to clear the fault condition again, or contact your service representative.

- If the fault is cleared, and if you do not need to reload the paper into the tractors (for example, the printer ran out of toner):

a. The printer goes OFFLINE.

b. Press ONLINE to resume printing.

- If the fault is cleared, and if you need to reload paper into the tractors (such as after a paper jam), the following message appears:

Reload Paper in Tractors

a. Reload the paper onto the tractors.

b. Press CLEAR.

c. Press ONLINE to resume printing. *Note that pages have been lost.*

- If the fault is cleared, and if you already have reloaded the paper while clearing the fault condition (in Step 2), the following message appears:

Not Reprinting Failed Pages

5. Press ONLINE to resume printing. Note that pages have been lost.

IMPORTANT **If Reprint on Fault is disabled and an error occurs, and if either the “Reload Paper in Tractors” or “Not Reprinting Failed Pages” message appears, then any pages removed from the printer will not be reprinted, and the data on them will be lost.**

Procedure For Fault Clearing - Reprint On Fault *Enabled*

1. A fault occurs.
2. Correct the fault condition.
3. Press CLEAR.
4. The STAND BY LED blinks and the following message appears while the printer attempts to clear fault:

   ```
   Standby ...
   Clearing Fault
   ```

- If the fault is not cleared:
  a. The printer beeps and briefly displays the following message:

     ```
     Faults Not Cleared
     ```

  b. The printer then redisplays the original fault message, or any other uncleared fault message.
  c. Attempt to clear the fault condition again, or contact your service representative.
- If the fault is cleared, and if you do *not* need to reload the paper into the tractors (for example, the printer ran out of toner):
  a. The printer goes OFFLINE.
  b. Press ONLINE to resume printing.

- If the fault is cleared, and if you need to reload paper into the tractors (such as after a paper jam), the following message appears:

  ```
  Clear Paper Path
  for Reprint
  ```

  a. Reload the paper onto the tractors.

b. Press CLEAR. The printer reprints only the pages affected by the fault (even though the message display reads “OFFLINE”).

c. Press ONLINE to resume printing.

- If the fault is cleared, and if you already have reloaded the paper while clearing the fault condition (in Step 2), the following message appears:

Reprinting Failed Pages

a. The printer reprints only the pages affected by the fault.

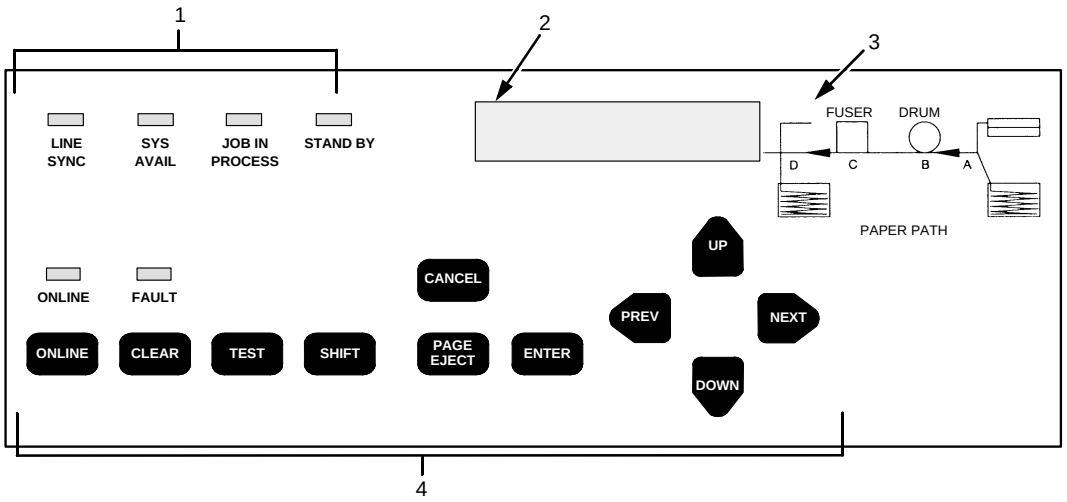
b. Press ONLINE to resume printing.

Error Messages

Table 6, “Error Messages,” on page 228, lists errors by error code and shows which are operator-correctable, which require field service, and which require reprinting.

- Operator-correctable errors include paper jams, missing consumables, and power paper stacker problems.
- Errors requiring field service are printer failures that require the attention of service personnel.
- Errors requiring reprinting are those errors which require reprinting to recover from an error condition.

NOTE: The letter designations (A-D) following the “Paper Jam” error messages in Table 6 match the sensor positions indicated on the control panel, as shown in the following illustration.



Legend:

1) Status Indicators
2) Liquid Crystal Display (LCD)
3) Sensor Positions A - D
4) Function Keys

Table 6. Error Messages

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
01	FRONT COVER OPEN	✓		See Note 3 and 6
08	CUT-SHEET PATH OPEN			
6C	CUT-SHEET COVER OPEN			
02	FANFOLD PAPER EMPTY	✓		See Note 4
66	NO PAPER TRAY	✓		✓

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
6F	CUT SHEET PAPER EMPTY	✓		✓
03	PAPER JAM AT FUSER (C)	✓		✓
04	PAPER JAM AT EXIT (D)	✓		✓
05	PAPER JAM AT EXIT (D)	✓		✓
0E	PAPER JAM AT EXIT (D)	✓		✓
0F	PAPER JAM AT EXIT (D)	✓		✓
10	PAPER JAM AT EXIT (D)	✓		✓
11	PAPER JAM AT DRUM (B)	✓		✓
12	PAPER JAM AT FUSER (C)	✓		✓
13	PAPER JAM AT EXIT (D)	✓		✓
16	PAPER JAM AT ENTRANCE (A)	✓		✓
1B	PAPER JAM AT ENTRANCE (A)	✓		✓
64	PAPER JAM AT ENTRANCE (A)	✓		✓
65	CUT SHEET PICK MISS		✓	✓
67	PAPER JAM AT ENTRANCE (A)	✓		✓
68	PAPER JAM AT ENTRANCE (A)	✓		✓
69	PAPER JAM AT ENTRANCE (A)	✓		✓

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
6A	PAPER JAM AT ENTRANCE (A)	✓		✓
6B	PAPER JAM AT ENTRANCE (A)	✓		✓
73	PAPER JAM AT ENTRANCE (A)	✓		✓
09	TRANSPORT MOTOR FAIL		✓	✓
14	TRACTOR MTR FWD SPEED ERR		✓	✓
15	TRACTOR MTR BKWD SPEED ERR		✓	✓
0A	CUTTER FAIL		✓	
0B	CUTTER FAIL		✓	
18	DRUM MOTOR FAIL		✓	
19	SURFACE VOLTAGE TOO HIGH		✓	
1A	SURFACE VOLTAGE TOO HIGH		✓	
1D	SURFACE VOLTAGE FAIL		✓	
18	DRUM MOTOR FAIL			
1E	FUSER SUPPLY FAIL		✓	
1F	FUSER FAILURE		✓	
20	FUSER LAMP OVERHEAT		✓	
21	FUSER FAN FAIL		✓	
22	EXHAUST FAN FAIL			

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
26	NO CLEANING UNIT	✓		
27	NO DEVELOPER UNIT			
28	WASTE TONER FULL	✓		
29	NO WASTE TONER BOX	✓		
2A	TONER LOW	See Note 5		
2B	TONER DENSITY TOO HIGH		✓	
2C	TONER DENSITY TOO LOW		✓	
2D	TONER EMPTY	✓		
2E	DEVELOPER MOTOR FAIL			
32	LED HEAD OVERHEAT		✓	
36	LED FAIL		✓	
37	LED FAIL		✓	
38	ENGINE CPU FAIL		✓	
39	ENGINE CPU FAIL		✓	
3A	ENGINE CPU FAIL		✓	
3B	ENGINE CPU FAIL		✓	
3C	ENGINE CPU FAIL		✓	
3D	ENGINE CPU FAIL		✓	
3E	ENGINE CPU FAIL		✓	
3F	ENGINE CPU FAIL		✓	
40	ENGINE CPU FAIL		✓	
41	ENGINE CPU FAIL		✓	

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
42	ENGINE CPU FAIL		✓	
43	ENGINE CPU FAIL		✓	
44	ENGINE CPU FAIL		✓	
45	ENGINE CPU FAIL		✓	
46	ENGINE CPU FAIL		✓	
47	ENGINE CPU FAIL		✓	
72	ENGINE CPU FAIL		✓	
48	CONTROLLER COMM. FAIL		✓	
49	CONTROLLER COMM. FAIL		✓	
4A	CONTROLLER COMM. FAIL		✓	
4B	CONTROLLER COMM. FAIL		✓	
4C	CONTROLLER COMM. FAIL		✓	
4D	CONTROLLER COMM. FAIL		✓	
4E	CONTROLLER COMM. FAIL			
50	STACKER FAIL		✓	
51	STACKER FAIL		✓	
52	STACKER FAIL		✓	
53	STACKER FAIL		✓	
54	STACKER INTERLOCK FAIL		✓	
55	STACKER FAIL		✓	
57	STACKER NOT READY	✓		
58	STACKER NOT READY	✓		✓

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
5A	STACKER FAIL		✓	
5B	STACKER FAIL		✓	
5C	STACKER NOT READY	✓		✓
56	STACKER FULL			
06	NO TRANSFER UNIT		✓	✓
0C	TRANSFER PLATFORM FAIL		✓	✓
0D	TRANSFER PLATFORM FAIL		✓	✓
07	SCUFF LEVER OPEN	✓		
78	MAIN CHARGER ERROR		✓	✓
79	TRANSFER CHARGER ERROR		✓	✓
7A	PRE-CHARGER ERROR		✓	✓
7B	CLEANING BIAS ERROR		✓	✓
7C	DEVELOPING BIAS ERROR		✓	✓
7D	SEPARATOR CHARGER ERROR		✓	✓
	TRAY MISMATCH	✓		
5D	STACKER FAIL		✓	
5E	STACKER FAIL		✓	
5F	STACKER FAIL		✓	
	FILE SYS FULL DELETE FILES	✓		✓
	FILE SYS FULL OPTIMIZE&REBOOT	✓		✓

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
	FILE SYS FULL ADD FLASH	✓		✓
	INSUFFICIENT RAM REBOOT/ADD RAM	✓		✓
	FILE EXISTS ENABLE OVERWRITE	✓		✓
	FILE SYS INVALID OPTIMIZE&REBOOT	✓		✓
	FILE SYS WRITE CHECK FLASH	✓		✓
	RELOAD PAPER PIN TRACTORS	✓		✓
	CLEAR PAPER PATH FOR REPRINT	✓		✓
	FRAMING ERROR		✓	✓
	PARITY ERROR		✓	✓
	BUFFER OVERRUN		✓	✓
	BUFFER OVERFLOW		✓	✓

TABLE NOTES:

1. For *any* error with Reprint on Fault enabled: If the printer stops while in the middle of printing a page, reloading the paper and reprinting are required. There may be other cases requiring reloading and reprinting; if so, a message will appear.
2. For *any* error with Reprint on Fault disabled: If the printer stops while in the middle of printing a page, reloading the paper is required and pages are lost.

3. For error numbers 01, 14, and 15: If the error occurs while paper is not moving, it is *not* necessary to reload or reprint.
4. For error number 02: If the error is caused by a paper-empty at the lower sensor (Paper Near End Sensor), it is not necessary to reprint.
5. Status message only. No operator action required to clear message

The Front Cover Open error can occur when either the Upper Doors or the Paper Output Door (as seen on the previous page) is open. If the Upper Doors are closed, push the Paper Output Door in to release it to its down position.

Chapter 6 System Status And Error Messages

A Maintenance Log Sheets

Maintenance Logs

The log sheets on the following pages are intended for your use. These may be photocopied and kept in a binder near the printer. Be sure to use them each time either you or your service provider perform printer maintenance.

Level A Maintenance - 15,000 Pages (User)

Action	Item	Part #	Performed By	Date
Clean	General cleaning	N/A		
Clean	Main charger	705741-001		
Clean	Precharger	705742-001		
Clean	Transfer charger	705743-001		
Clean See Note 1	Cover glass	N/A		
Clean See Note 2	Cut sheet cassette pickup rollers	703531-050		
Clean See Note 2	Cut sheet cassette reverse rollers	703531-051		
Replace See Note 3	Toner cartridge	703532-001		

Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first.
Note 2: Only applies to printers with the cut sheet option installed.
Note 3: The Toner cartridge should be replaced about every 21,000 pages or as needed (for page coverage of 4%)

Level B Maintenance - 150,000 Pages (User)

Action	Item	Part #	Performed By	Date
Clean	General cleaning	N/A		
Clean	Main charger	705741-001		
Clean	Precharger	705742-001		
Clean	Transfer charger	705743-001		
Clean See Note 1	Cover glass	N/A		
Clean	SELFOC lens	N/A		
Vacuum	Lamp housing filter	202838-001		
Vacuum	Cleaning unit	705740-001		
See Note 2	Photoreceptor drum	703535-001		
Replace See Note 3	Toner cartridge	703532-001		
Replace	Developer	703548-001		
Replace	Waste toner bottle	703539-001		
Clean See Note 4	Cut sheet cassette pickup rollers	703531-050		
Clean See Note 4	Cut sheet cassette reverse rollers	703531-051		

Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first.

Note 2: Inspect every 150,000 pages; clean if needed. Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media being used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) may reduce drum life by as much as 50%.

Note 3: The Toner cartridge should be replaced about every 21,000 pages or as needed (for page coverage of 4%).

Note 4: Only applies to printers with the cut sheet option installed.

Level C Maintenance - 600,000 Pages (User)

Action	Item	Part #	Performed By	Date
Clean	General cleaning	N/A		
Clean See Note 1	Cover glass	N/A		
Clean	SELFOC lens	N/A		
See Note 2	Photoreceptor drum	703535-001		
Replace	Developing Unit	705739-001		
Replace See Note 3	Toner cartridge	703532-001		
Replace	Waste toner bottle	703539-001		
Clean See Note 4	Cut sheet cassette pickup rollers	703531-050		
Clean See Note 4	Cut sheet cassette reverse rollers	703531-051		

Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first.

Note 2: Inspect every 150,000 pages; clean if needed. Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media being used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) may reduce drum life by as much as 50%.

Note 3: The Toner cartridge should be replaced about every 21,000 pages or as needed (for page coverage of 4%).

Note 4: Only applies to printers with the cut sheet option installed.

Level D Maintenance - 300,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace	Smoke filter	703540-001		

Level E Maintenance - 600,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Lamp housing filter	202838-001		
Clean	LED air filter	703543-001		
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace See Note 1	Cleaning unit	705740-001		
Replace	Smoke filter	703540-001		
Replace	Transporting belt-3	703531-035		

Note 1: When the cleaning unit has been vacuumed every 150,000 pages and has been used under nominal operating conditions, it must be replaced at 600,000 pages. However, it may need to be replaced more frequently if used for high–density printing or printing on uneven media, or if used under severe operating conditions.

Level F Maintenance - 900,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace	Smoke filter	703540-001		
Replace	Xenon lamp	703541-001		

Level G Maintenance - 1,200,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Lamp housing filter	202838-001		
Clean	LED air filter	703543-001		
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace See Note 1	Cleaning unit	705740-001		
Replace	Smoke filter	703540-001		
Replace	Transporting belt-3	703531-035		

Note 1: When the cleaning unit has been vacuumed every 150,000 pages and has been used under nominal operating conditions, it must be replaced at 600,000 pages. However, it may need to be replaced more frequently if used for high–density printing or printing on uneven media, or if used under severe operating conditions.

Level H Maintenance - 2,400,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Flash power supply filter	n/a		
Replace	Main Charger	705741-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace See Note 1	Cleaning unit	705740-001		
Replace	Smoke filter	703540-001		
Replace	Transporting belt-3	703531-035		
Replace	Lamp housing filter	202838-001		
Replace	LED air filter	703543-001		
Replace	Tractor belt 3M264	703531-031		
Replace	Drum belt 3M264	703531-031		
Replace	Capacitor (see ***WARNING*** on following page)	703542-001		
Replace	LED for discharge lamp	703531-118		
See Note 2	Feed Roller	703531-563		
See Note 2	Resist Roller	703531-565		
See Note 2	Roller, Pre Drum	703531-590		
See Note 2	Lever, Empty	202840-001		
Replace	EPS1, EPS3, and EPS4 Sensor Levers	703531-585 703531-588 703531-067		

Note 1: When the cleaning unit has been vacuumed every 150,000 pages and has been used under nominal operating conditions, it must be replaced at 600,000 pages. However, it may need to be replaced more frequently if used for high–density printing or printing on uneven media, or if used under severe operating conditions.
Note 2: Clean and inspect; replace if worn. (Only applies to printers with the cut sheet option installed.)

Appendix A Maintenance Logs

WARNING **The flash fuser capacitor (P/N 703531-561) must be replaced at least every 2,400,000 letter size pages. Failure to do so may endanger equipment and personnel.**

WARNUNG

Der kondensator der Flash-Einbrennvorrichtung muß nach mindestens 2.400.000 Seiten im Format “Letter” ausgetauscht werden. Geschieht dies nicht, ist mit Personen- und Sachschäden zu rechnen.

AVISO

El condensador flash del fusor se debe sustituir como mínimo cada 2.400.000 páginas de tamaño carta. De lo contrario, pueden causarse daños a los equipos y al personal.

ATTENTION

Pour éviter tout risque de dégâs matériels et corporels, remplacez l’unité de flashage aprés l’impression de 2 400 000 pages de format lettre.

AVVERTENZA

Il condensatore dell’unitá fusore deve essere sostituito almeno ogni 2.400.000 pagine in fprmato lettera. La mancata sostituzione puó causare lesione al personale e danni all’apparecchiatura.

CAUTION **Due to the high temperature of the flash fusing unit, keep the area under the fuser free of paper debris.**

B *Specifications*

Paper Specifications

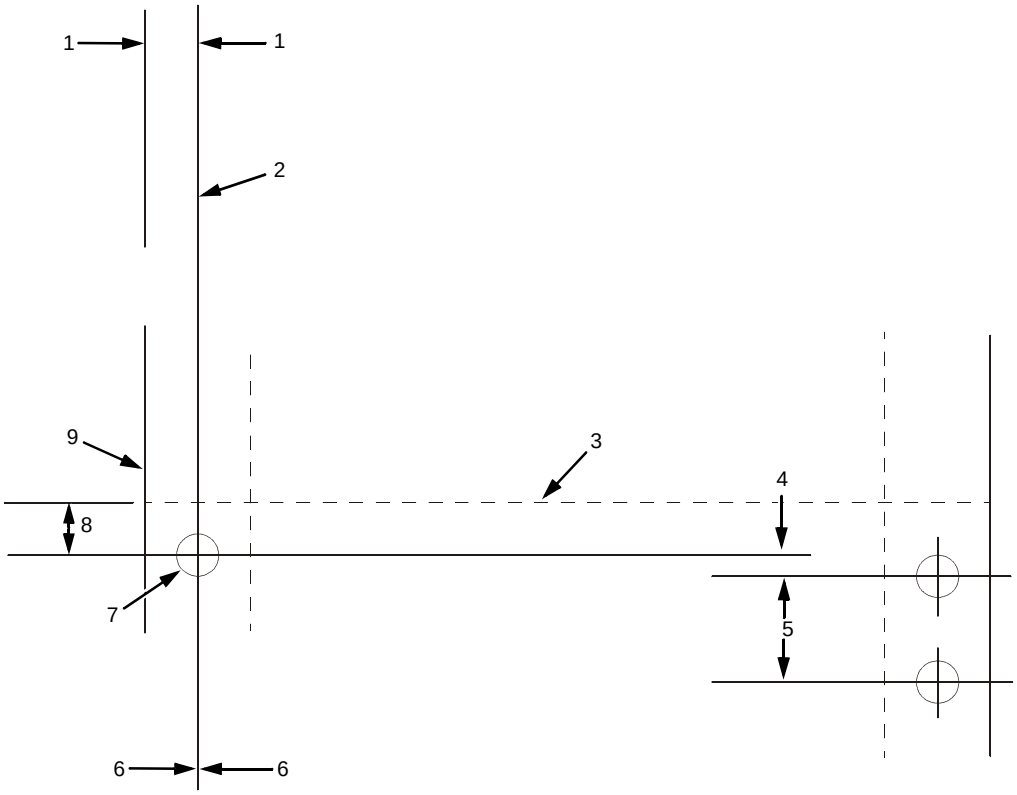
Paper type	Fanfold
Paper size	
Width	7 to 16 inches
Length*	1 to 30 inches, in multiples of 1/6 inch.

* Measured from main folding/cutting perforation to main folding/cutting perforation.

Tractor pin holes	See the table and figure below.

Appendix B Specifications

Specification	Inch	Millimeter	Dimension in Figure
Pin hole center to folding perforation	1/6, 1/4, 1/3, or 1/2	4.23, 6.35, 8.47, 1.20	8
Hole center line to edge of form	0.236 ± 0.028	6.0 ±0.1	1
Hole diameter	0.156 ± 0.004	4.0 ±0.1	N/A
Distance between centers of two consecutive holes	0.500 ± 0.002	12.7 ±0.05	5
Max. deviation of holes from their center line	0.004	0.1	6
Max. deviation Left Hand hole to companion Right Hand hole (Center Line to Center Line)	0.006	0.15	4
Max. parallel deviation Left Hand hole Center Line to Right Hand hole Center Line	0.006	0.15	N/A



Legend:

1) Hole centerline to edge of form
2) Center Line
3) Main Folding/Cutting Perforation
4) Centerline to Centerline
5) Distance between centers of two consecutive holes
6) Center Line Deviation
7) Tractor Pin Hole
8) Pin hole to perforation
9) Fanfold Paper

Paper thickness	.010 inch maximum
Paper weight	18 to 44 lb. bond (68-165g/m^2), 44-125 lb. tag/label (75-204g/m^2)
Paper feed	Automatic paper parking mechanism incorporated
Maximum paper stack size	3000 sheets (18 lb.)
Folder Perforation	
Cut	0.12 inches or 3mm minimum
Cut to Tie	3:1 minimum

Performance Characteristics

Printing Density	300 x 300 dpi 400 x 400 dpi or 240 x 240 dpi (options)

Printing Speed

Fanfold paper	5.0 inches per second for continuous, fanfold forms. See the following table for printing speeds for common paper sizes

Paper Size	Orientation	Printing Speed (Pages per Minute)
A4	Landscape	35
Letter	Landscape	35
A4	Portrait	27
Letter	Portrait	27

Cut sheet paper. See the table below.

Paper Size	Cassette	Orientation	Printing Speed (Pages per Minute)
A4	Lower	Long edge fed	27
Letter	Lower	Long edge fed	27
A4	Upper	Long edge fed	23
Letter	Upper	Long edge fed	23
A3	Upper	Short edge fed	15
Legal	Upper	Short edge fed	15

Maximum efective print width	14.7 inches
Duty cycle	300,000 total pages/ month of fanfold paper form (11-inch length) and or cut sheet paper (letter)
Mechanical life	5 years or 18,000,000 pages (11 inch length)
Warm-up time	150 sec. max.
First page printing time	25 sec. max.
MTBF/MPBF	8,000 hrs./2,880,000 pages (letter size) 25% print to power on ratio
MTTR	2 hour max. (unit exchange)

Host Interfaces

Standard	Centronics parallel, Dataproducts parallel, serial RS-232/422

NOTE: Dataproducts parallel interface requires an adapter cable.

Optional	Coax/Twinax Ethernet network adaptor

Emulations

Standard	LinePrinter Plus
Optional	PCL5/LP+ PCL5/PGL PCL5/VGL IGP/VGL IGP/PGL IPDS CTHI (if installed)

Memory Requirements

The L5000 series printers have 32 MB (standard) or 64 MB (optional) of RAM (Random Access Memory), and 8 MB (standard) or 16, 32, or 64 (optional) of Flash Memory. This is standard with all new printer shipments, and all upgraded printers.

Appendix B Specifications

Safety Regulations

UL	1950
CSA	950
EUROPE	EN 60950

Electromagnetic Interference

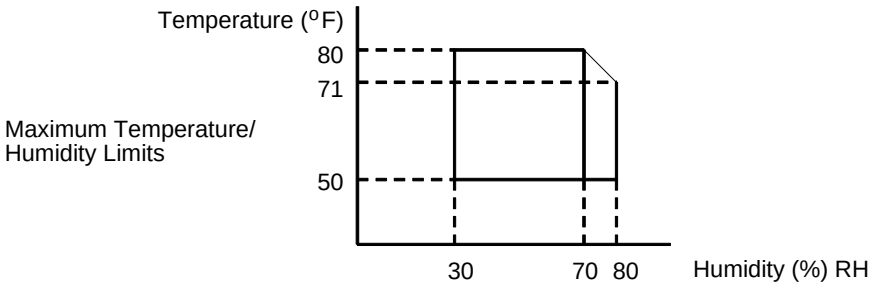
FCC	Class A
Europe	EN55022 Class A

Physical Characteristics and Environment

Dimensions (H x W x D)	49 inch H x 30 inch W x 34 inch D In crate: 36 inches H x 58 inches W x 61 inches D
Weight	353 lbs. (or 441 lbs.) with options
Input voltage range	200 - 240 V ±10% 50/60 Hz (47 - 62 Hz) single phase
Power consumption	3300 W (operating); wall outlet *must* be on a 30-amp breaker.

Environment

Temperature	Operating: 50° to 80° F (10° to 27° C) Non-operating: 14° to 95° F(-10° to 35° C)
Humidity	Operating: 30 to 80% RH Non-operating: 10 to 80% RH (non-condensing)



Sound level

Operating	60 db (A-weighted) max. Full options
Standby state	50 dB (A-weighted)
Inclination	1° max.

Appendix B Specifications

C *Host I/O Interfaces*

Interfaces

The printer provides connections on the right rear side panel for the following host I/O interfaces:

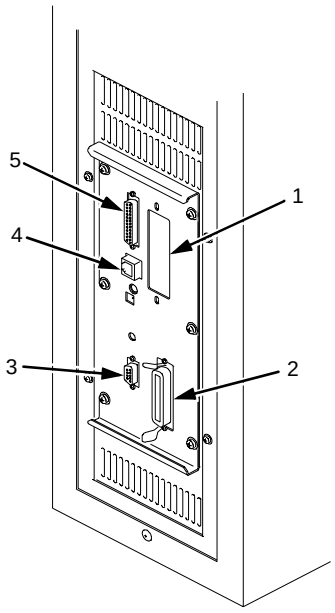
- Serial Interface (RS-232 or RS-422)
- Centronics Parallel Interface
- Dataproducts Parallel Interface
- IEEE 1284 Parallel Interface
- Ethernet Interface (if installed)

All interfaces can be active simultaneously via Auto Switching. The parameters for each interface are selected through the control panel via the “Host Interface” menu as described on page 75.

The location of the interface connectors is shown in Figure 6.

You must supply the interface cable to connect the printer to your host computer. To facilitate the choice or manufacture of an interface cable for your application, configuration and signal information is provided on the Serial, Centronics, Dataproducts, and IEEE 1284 interfaces in this appendix.

Appendix C Host I/O Interfaces



Legend:

1) Parallel Port/Optional Ethernet Port
2) General Purpose I/O Port
3) Optional Coax/Twinax Port
4) Diagnostic Port
5) Serial Port

Figure 6. Interface Cable Connections

Performance Considerations

The printer prints letter size and A4 size fanfold paper at 27 pages per minute portrait (one page every 2.2 seconds) and 35 pages per minute landscape. To sustain printing at full speed, data for each page must be received and rendered in less than 2.2 seconds for portrait mode (otherwise the printer will pause).

Failure to print at full speed may be caused by one or more of the following:

- an inefficient application program
- an insufficient communication interface bandwidth
- a slow host computer
- a low priority on the host printer port or printing task
- a highly complex print job, usually containing a large number of characters and graphics that exceeds the bandwidth of the controller

An inefficient application program is listed first because a highly efficient program sends fewer characters to the printer than a less effective program, and it can be used to overcome the other four causes of performance problems. This is especially true of IGP/VGL and IGP/PGL applications, due to the power of these printer emulations. In many cases, converting a program from IGP/VGL to IGP/PGL results in substantial performance improvements.

Wide width printing jobs with a large number of characters on a page can exceed the communication bandwidth and/or the communication speed of the host computer. A plain text print job of 132 columns by 66 lines requires a sustained data transmission rate of 3485 characters per second, or for serial communication a sustained throughput of 34.85 KBaud (assuming 8 bits of data, 1 stop bit, 1 start bit, and no parity bit). Sustaining high communication data transfer rates may require the host computer to be tuned to meet the printer's speed requirements. On mini or mainframe computers, printer performance problems can usually be solved by having the system administrator perform one or more of the following:

- assign a higher priority to the print spooler
- increase the size of the host's output buffer
- dedicate a communication controller to the printer

Solving system performance problems with IBM-compatible PC's varies depending upon the operating system (OS/2®, Windows®, or DOS®) and the speed and manufacturer of the PC. Performance problems with networked printers are best left to the expertise of the network administrator, since each element between the printer and the host computer can affect performance.

There will be cases where the desired printout is sufficiently complex to exceed the bandwidth of the controller. This will be evident if the printer is exerting the communication flow control for extended periods of time followed by a printer pause. Assuming that the software application has already been tuned for efficiency, under these circumstances, do the following:

1. Check to see if the minimum amount of memory is installed (see Appendix B, "Specifications").
2. Try changing the font cache memory allocation based upon the size of characters being sent. See the "Maximum Cached Characters" topic on page 109 for details.
3. Set the Image Width configuration menu parameter to the minimum width required for the print job.
4. Try to minimize the number of font changes per page.
5. Try to decrease the printing resolution (400 DPI to 300 DPI, or 300 DPI to 240 DPI).
6. Decrease the complexity and/or number of characters in the printed output.

For application efficiency in IGP/PGL or IGP/VGL, it is best to store a form in the printer and then execute it with dynamic data, rather than send the entire form each time. Also if possible, eliminate sending white space (spaces or tabs) at the end of lines if it is not necessary.

Memory intensive applications may require an adjustment to the allocation of global memory for optimal performance. This may include applications where:

- the form length is greater than 24 inches
- a great number of forms or fonts are being used interchangeably
- the printing resolution is 400 dpi

Refer to the *L5535 Maintenance Manual* or contact a qualified service representative for details on adjusting the global memory.

RS-232 Serial Interface

This interface is used with bit serial devices compatible with EIA® RS-232C or CCITT V.24 standards. The interface circuit characteristics are compatible with the Electronic Industry Association Specification.

The printer is configured as Data Terminal Equipment (DTE).

The serial data transfer baud rate is selectable from the control panel. The input format consists of a single start bit, 7 or 8 data bits, and one or two stop bits. The operator can set the number of data bits from the control panel. The data bits are interpreted with the least significant bit first. The operator can also set parity checking via the control panel. The printer interface uses a first-in/first-out buffer with the size selectable from the control panel. The asynchronous interface accepts data as it is provided by the host computer.

The maximum cable length from the host computer to the printer is 50 feet.

The maximum baud rate supported by the RS-232 serial interface is 115.2 KB.

Printing at full-rated speed may require either an RS-422 or parallel connection for wide format printing applications.

RS-232 Serial Interface Connector Pin Assignments

The printer provides a 25-pin DB-25S connector on the right, rear side panel for connection of a serial interface cable. This connector is also used for the RS-422 serial interface. Selection of the desired interface is determined by the position of the RS-232/422 switch located on the right, rear side panel of the printer.

The following table lists the pin assignments of the RS-232 interface connector.

Pin	Signal	Direction
1	Chassis Ground	Not applicable
2	Transmit Data (TxD)	From printer
3	Receive Data (RxD)	To printer
4	Request To Send (RTS)	From printer
5	Clear To Send (CTS)	To printer
6	Data Set Ready (DSR)	To printer
7	Signal Ground	Not applicable
8	Carrier Detect (CD)	To printer
11, 14	Reverse Channel (RC)	From printer
20	Data Terminal Ready (DTR)	From printer

RS-232 Serial Interface Signals

The RS-232 serial interface signals are defined below.

Receive Data (RxD) - Serial data stream to the printer.

Transmit Data (TxD) - Serial data stream from the printer for transmitting status and control information to the host. Subject to protocol selection.

Request To Send (RTS) - Control signal from the printer. Subject to configuration.

Clear To Send (CTS) - Status signal to the printer indicating the host is ready to receive data/status signals from the printer. When CTS is enabled, DSR and CTS must both be asserted for the printer to transmit flow control characters to the host.

Data Set Ready (DSR) - Status signal to the printer indicating the host is in a ready condition. DSR is ignored unless CTS or CD are enabled.

Carrier Detect (CD) - Status signal to the printer. The ON condition is required for the printer to receive data. Available as a configuration setup option. When CD is enabled, the host must assert both DSR and CD for the printer to *accept data.*

Data Terminal Ready (DTR) - Control signal from the printer to the host. When enabled, the host will activate the data channel. Subject to configuration.

RS-232 Serial Interface Configuration

The printer is configured for the RS-232 serial interface via the Serial Interface menu, as described on page 82. The following interface configuration parameters may be modified to meet specific application requirements:

Host Protocol	XON/XOFF
Baud Rate	9600
Data Bits (Word Length	8 Data Bits
Stop Bits	1 Bit

Parity	None
Data Term Ready	True
RTS Function	Online & BNF
Buffer Size In K	64
Poll Character	0
Poll Response	0 MS
Idle Response	Disable
One Char Enquiry	Disable

RS-422 Serial Interface

This interface is used with bit serial devices compatible with EIA-RS-422A or CCITT V.27 and V.11 standards. The interface circuit characteristics are compatible with the Electronic Industry Association Specification.

The printer is configured as Data Terminal Equipment (DTE).

The serial data transfer baud rate is selectable from the control panel. The input format consists of a single start bit, 7 or 8 data bits, and one or two stop bits. The operator can set the number of data bits from the control panel. The data bits are interpreted with the least significant bit first. The operator can also set parity checking via the control panel. The printer interface uses a first-in/first-out buffer with the size selectable from the control panel. The asynchronous interface accepts data as it is provided by the host computer.

The maximum cable length from the host computer to the printer is 4000 feet.

The maximum baud rate supported by the RS-422 serial interface is 115.2 KB.

RS-422 Serial Interface Connector Pin Assignments

The printer provides a 25-pin DB-25S connector on the right side panel for connection of a serial interface cable. This connector is also used for the RS-232 serial interface. Selection of the desired interface is determined by the position of the RS232/422 switch located on the right, rear side panel of the printer.

The following table lists the pin assignments of the RS-422 interface connector.

Pin	Signal	Direction
1	Chassis Ground	Not applicable
2	Transmit Data A (TxDA)	From printer
14	Transmit Data B (TxDB)	From printer
3	Receive Data A (RxDA)	To printer
16	Receive Data B (RxDB)	To printer
4	Request To Send A (RTSA)	From printer
19	Request To Send B (RTSB)	From printer
5	Clear To Send A (CTSA)	To printer
13	Clear To Send B (CTSB)	To printer
6	Data Set Ready (DSR) / Clock A	To printer
22	Clock B	To printer
7	Signal Ground	Not applicable
20	Data Terminal Ready A (DTRA)	From printer
23	Data Terminal Ready B (DTRB)	From printer

RS-422 Serial Interface Signals

The RS-422 serial interface signals are defined below.

Received Data (RxD) - Serial data stream from the host to the printer.

Transmitted Data (TxD) - Serial data stream from the printer to the host. Subject to protocol selection.

Request To Send (RTS) - Control signal from the printer to request permission to send data to the host. Subject to configuration.

Clear To Send (CTS) - Status signal to the printer indicating the host is ready to receive data/status signals from the printer. When CTS is enabled, DSR and CTS must both be asserted for the printer to transmit flow control characters to the host.

Data Set Ready (DSR) / Clock B - Status signal to the printer indicating the host is in a ready condition. DSR is ignored unless CTS is enabled.

Data Terminal Ready (DTR) - Control signal from the printer to the host. When enabled, the host will activate the data channel. Subject to configuration.

Clock Signal B - External timing for signals on data channel B.

RS-422 Serial Interface Configuration

The printer is configured for the RS-422 serial interface via the Serial Interface menu, as described on page 82. The following interface configuration parameters may be modified to meet specific application requirements:

Host Protocol	XON/XOFF
Baud Rate	9600
Word Length	8 data bits
Stop Bits	1 Bit
Parity	None
Data Term Ready	True
RTS Function	Online & BNF
Buffer Size In K	64
Poll Character	0
Poll Reponse	0 MS
Idle Response	Disable
One Char Enquiry	Disable

Centronics Parallel Interface

This interface enables the printer to operate with controllers designed for buffered Centronics printers. The interface is capable of transferring up to 200,000 characters per second. The maximum cable length from the controller (host computer) to the printer is 15 feet.

Centronics Parallel Interface Connector Pin Assignments

The printer provides a 36-pin D-shell connector on the right side panel for connection of a Centronics parallel interface cable. The following table lists the pin assignments of the Centronics interface connector.

Input Signals		Output Signals	
Signal	Pin	Signal	Pin
DATA LINE 1	2	ACKNOWLEDGE	10
DATA LINE 2 Return	3 21	SELECT	13
DATA LINE 3 Return	4 22	PAPER EMPTY Return	12 30
DATA LINE 4 Return	5 23	BUSY Return	11 29
DATA LINE 5 Return	6 24	PRIME	31
DATA LINE 6 Return	7 25	NFAULT	32
DATA LINE 7 Return	8 26		
DATA LINE 8 Return	9 27	Reserved	36
PAPER INST Return	15 14	Chassis GND	17
DATA STROBE Return	1 19	Spares	33, 34, 35

Centronics Parallel Interface Signals

The Centronics interface signals are defined below.

PAPER EMPTY (PE) - A high true level from the printer to indicate the printer is in a fault condition.

SELECT - A high true level from the printer to indicate the printer is ready for data transfer and the ONLINE key has been activated.

BUSY - A high true level from the printer to indicate the printer cannot receive data.

ACKNOWLEDGE - A low true pulse from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

DATA STROBE - A low true, 100 ns minimum pulse from the host to clock data into the printer.

DATA LINES - Eight standard or inverted levels from the host that define the data, which may consist of a character or function code. Sensing Data Line 8 is controlled by printer configuration.

PAPER INST - Optional VFU control signal from the host with the same timing and polarity as the data lines. Sensing of the PAPER INST line (PI line) is controlled by printer configuration.

PRIME - Optional low true signal from the host used to reset the printer to its default power-up state.

NFAULT - A low true level from the printer to indicate the printer is in a fault condition.

NOTE: The PAPER INST line must be disabled (configuration option selected from the control panel) if the host computer does not drive or control it. If the line is not controlled by the host and PAPER INST line sensing is enabled in the printer, rapid paper slewing will occur.

Centronics Parallel Interface Configuration

The printer is configured for the Centronics interface via the Centronics Interface menu, as described on page 76. The following interface configuration parameters may be modified to meet specific application requirements:

Data Bit 8	Enable
PI Ignored	Disable
Data Polarity	Standard
Resp. Polarity	Standard
Busy On Strobe	Enable
Latch Data On	Leading
Prime Signal	Enable
TOF Action	Reset
Buffer Size In K	64

Note: Only the factory default settings are shown above. See page 76 for additional options.

Dataproducts Parallel Interface

This interface allows the printer to operate with controllers designed for Dataproducts printers. The interface is capable of transferring up to 500,000 characters per second. The maximum cable length from the controller (host computer) to the printer is 40 feet.

Dataproducts Parallel Interface Connector Pin Assignments

The printer provides a 36-pin D-shell connector on the right side panel for connection of a parallel interface cable. This 36-pin connector requires a cable adapter to convert it to a 50-pin AMP connector for Dataproducts compatibility. Contact the factory for the adapter (p/n 703316-001). The following table lists the pin assignments of the Dataproducts cable adapter.

Input Signals		Output Signals	
Signal	Pin	Signal	Pin
DATA LINE 1	19	READY Return	22 6
DATA LINE 2 Return	19 3	ON LINE Return	21 5
DATA LINE 3 Return	1 2	DATA REQUEST Return	23 7
DATA LINE 4 Return	41 40	Return	39
DATA LINE 5 Return	34 18	Interface Verif.	45, 46
DATA LINE 6 Return	43 42	PAPER INST Return	30 14
DATA LINE 7 Return	36 35		
DATA LINE 8 Return	28 44		
DATA STROBE	15 14		
DATA STROBE Return	38 37		

Dataproducts Parallel Interface Signals

The Dataproducts interface signals are defined below.

READY - A high true signal from the printer indicating AC power and DC voltages are present, paper is loaded properly, and the printer is not in a fault condition.

ON LINE - A high true signal from the printer indicating the Ready Line is true and the ONLINE key on the control panel has been activated. The printer is ready to accept data from the host.

DATA REQUEST - A high true signal from the printer to synchronize host data transmission with printer timing. This signal goes true when the printer is ready to receive data. It changes to the false state shortly after the leading edge of the data strobe signal.

DATA STROBE - A high true pulse from the host to indicate that data is ready. The data strobe must remain high at least until the Data Request line goes false.

DATA LINES - Eight standard or inverted levels from the host that specify character data, plot data, or a control code. Sensing Data Line 8 is controlled by printer configuration.

PAPER INST - Optional standard or inverted level VFU control signal from the host with the same timing and polarity as the data lines. Sensing of the PAPER INST line (PI line) is controlled by printer configuration.

NOTE: The PAPER INST line must be disabled (configuration option selected from the control panel) if the host computer does not drive or control it. If the line is not controlled by the host and PAPER INST line sensing is enabled in the printer, rapid paper slewing will occur.

INTERFACE VERIFICATION- Two pins on the interface connector jumpered together allow you to verify proper installation of the interface connector.

Dataproducts Parallel Interface Configuration

The printer is configured for the Dataproducts interface via the Dataproducts Interface menu, as described on page 79. The following interface configuration parameters may be modified to meet specific application requirements:

Data Bit 8	Enable
PI Ignored	Disable
Data Polarity	Standard
Resp. Polarity	Standard
Latch Data On	Middle
Prime Signal	Disable
TOF Action	Reset
Buffer Size In K	64

IEEE 1284 Parallel Interface Configuration

The printer is configured for the IEEE 1284 interface via the IEEE 1284 Interface menu, as described on page 90. The following interface configuration parameters may be modified to meet specific application requirements:

Prime Signal	Enable
TOF Action	Reset
Buffer Size in K	64

Termination Resistors

For parallel interface configurations, the printer is equipped with 470 ohm pullup and 1K pulldown terminating resistors located on the printer motherboard, P/N 703220-001.

Generally, these terminating resistors are suitable for most applications. If, however, the standard terminating resistor pack is not compatible with the particular interface driver requirements of your host computer, other values or combinations of pullup/ pulldown resistors may be necessary. For example, the Dataproducts interface and some host computers require the use of 220 ohm pullup and 330 ohm pulldown resistors.

If you are experiencing communication problems between the printer and host (double or missing characters), the cause may be the value of the termination resistors on the motherboard. Contact your authorized service representative for instructions on replacing the termination resistors.

Ethernet Interface Configuration

The printer can be installed and configured for the Ethernet interface via the Ethernet Interface menu, as described on page 92.

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